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VOL. XIX SEPTEMBER, 1923 NO. 9

CONTENTS:

PAGE

THE NEW TREND OF ASIATIC POLITICS

- (1) Japan's Position in the Naval Race 569
- (2) The New Anti-Japanese Agitation 570
- (3) The Bogey 571
- (4) Japan Holds the Balance of Power *573

THE TREND OF EVENTS IN CHINA *574
THE TREND OF MISSIONARY ENDEAVOR IN CHINA ... 576
IS AMERICA AN ELEEMOSYNARY INSTITUTION? 577
EDUCATION, THE ONLY HOPE FOR CHINA *579
THE TREND OF EVENTS IN THE PHILIPPINES *582
AN ORGY OF MISMANAGEMENT *584
THE CHINA SOCIETY OF AMERICA *586
SIX MEN OUT OF A JOB 587
FOREIGN SUPERVISION OVER CHINA'S RAILWAYS... ... 587
TOMOSABURO KATO *590
NOTES ON THE PENANG WATER SUPPLY *591
PRAI WATER SUPPLY *595
CHINA'S COTTON INDUSTRY—2 ... ... *598
THE MINES OF INDO-CHINA... ... ... *604
COAL MINING IN THE MARITIME DISTRICT 613
30,000,000 CIGARETTES DAILY 620
THE TESTING OF RAILWAY COUPLINGS *621
FORESTS IN THE BASIN OF THE USSURI RIVER 622
CHINESE GOVERNMENT RAILWAYS 623
CANTON RECLAMATION PROJECT 624

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Greenfield Tap & Die Corp. 19
Greening & Sons, Ltd., N. 41

Heap & Co., Ltd., Joshua 53
Hongkong Rope Manufacturing Co. 20
Hongkong & Shanghai Banking Corporation 59
Hongkong & Whampoa Dock Co., Ld. 30
Hotel Statler Co. 63
Humber, Ltd. 626

Imperial Japanese Government Railways 66, 67
Industrial Bank of Japan 58
International Banking Corporation 55
International General Electric Co., Inc. 51
Iron Ore and Iron Industry of China 624

Japan Sugar Co., Ltd. 6
Jardine Engineering Corporation, Ltd., The 12 & 627
Jones & Lamson Machine Co. 53
Jugo Ginko 56

Kanegafuchi Spinning Co., Ltd. 10
Kawasaki Dockyard Co., Ltd. 35
Kellogg Switchboard & Supply Co. Under Index
Kokusai Kisen Kaisha 45
Koster Co., The, Cover

London Directory Co., Ltd. 61

Manning, Maxwell & Moore, Inc. 28
Mather and Platt, Ltd. 16
Mayhew Steel Products, Inc. 71
Mechanical Eng. Co. (Manchester), Ld. 70
Metropolitan Vickers Electrical Co., Ltd. 74
McClintic-Marshall Products Co. 27
McConway and Torley Co. 39
Mitsubishi Bank, Ltd. 57
Mitsubishi Iron & Steel Co., Ltd. 38
Mitsubishi Marine & Fire Ins. Co., Ld. 38
Mitsubishi Shoji Kaisha 18
Mitsubishi Warehouse Co. 38
Mitsubishi Zosen Kaisha, Ltd 36
Mitsui Bank, Ltd. 57
Mitsui Mining Co. 18
Mitsui Bussan Kaisha 26
Motor Rail & Tram Car Co. 42
Mustard & Co. 39

New Engineering & Shipbuilding Works 34
New Imperial Cycles, Ltd. 624
Nippon Menkwa Kabushiki Kaisha 50
Nippon Yusen Kaisha 46, 47
Nobel Industries, Ltd. 22

Okura & Co. (Trading), Ltd. 24
One Hundredth Bank, Ltd., The 59

Petters, Ltd. 41
Pooley & Son, Ltd., Henry 2

Redpath Brown & Co., Ltd. 28
Royal Bank of Canada 61
Ruston & Hornsby, Ltd. 42

Sale & Frazar, Ltd. 8
Shanghai Dock & Eng. Co., Ltd 32
Shanghai Municipal Council 4
Siber Hegner & Co., Ltd 11
Simons & Co., Ltd., Wm. 14
Smidth & Co., F. L. 628
South Manchuria Railway Co. 64, 68, 69
Standard Oil Co. of N. Y. 29 & 626
Standard Underground Cable Co. 70
Stewarts & Lloyds, Ltd. 62
Sturtevant Co., B. F. 7
Sulzer Bros. 624
Sumitomo 60
Sumitomo Bank, Ltd. 60
Superheater Co., The 19

Thornycroft & Co., Ltd. John I. 1
Toshin Soko 40
Toyo Kisen Kaisha 43
Trimont Manufacturing Co. 9

United States Steel Products Company 23, 37, Back Cover

Walworth International Co. 74
Wharton, Jr. & Co. Inc., Wm. 21
Whittall & Co., Ltd., J. 6
Wild & Co., Ltd., M. B. 9
Williams & Co., J. H. 17
Worthington Pump & Machinery Corporation, 72

Yarrow & Co., Ltd. Cover
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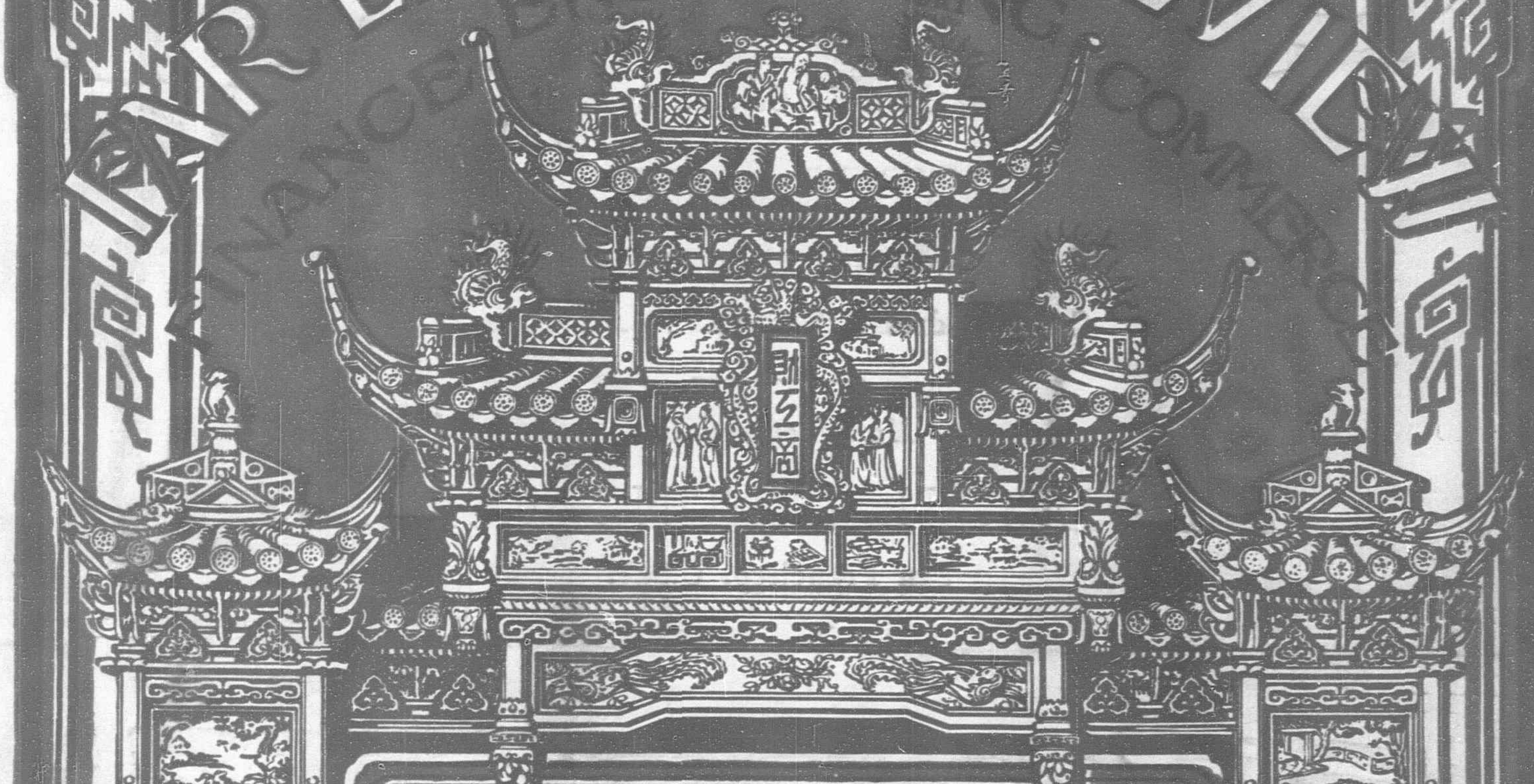

The New Trend of Asiatic Politics

The Japanese Naval Program
The Significance of Singapore
Japan Holds the Balance of Power
The Paramount American Interest in China
America, An Eleemosynary Institution
Education, the Only Hope for China
America's Lost Opportunity in the Philippines
Story of the Philippine National Bank;
An Orgy of Mismanagement
The China Society

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Mines of Indo-China

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Vol. XIX September, 1923 No. 9

UNIVERSIT
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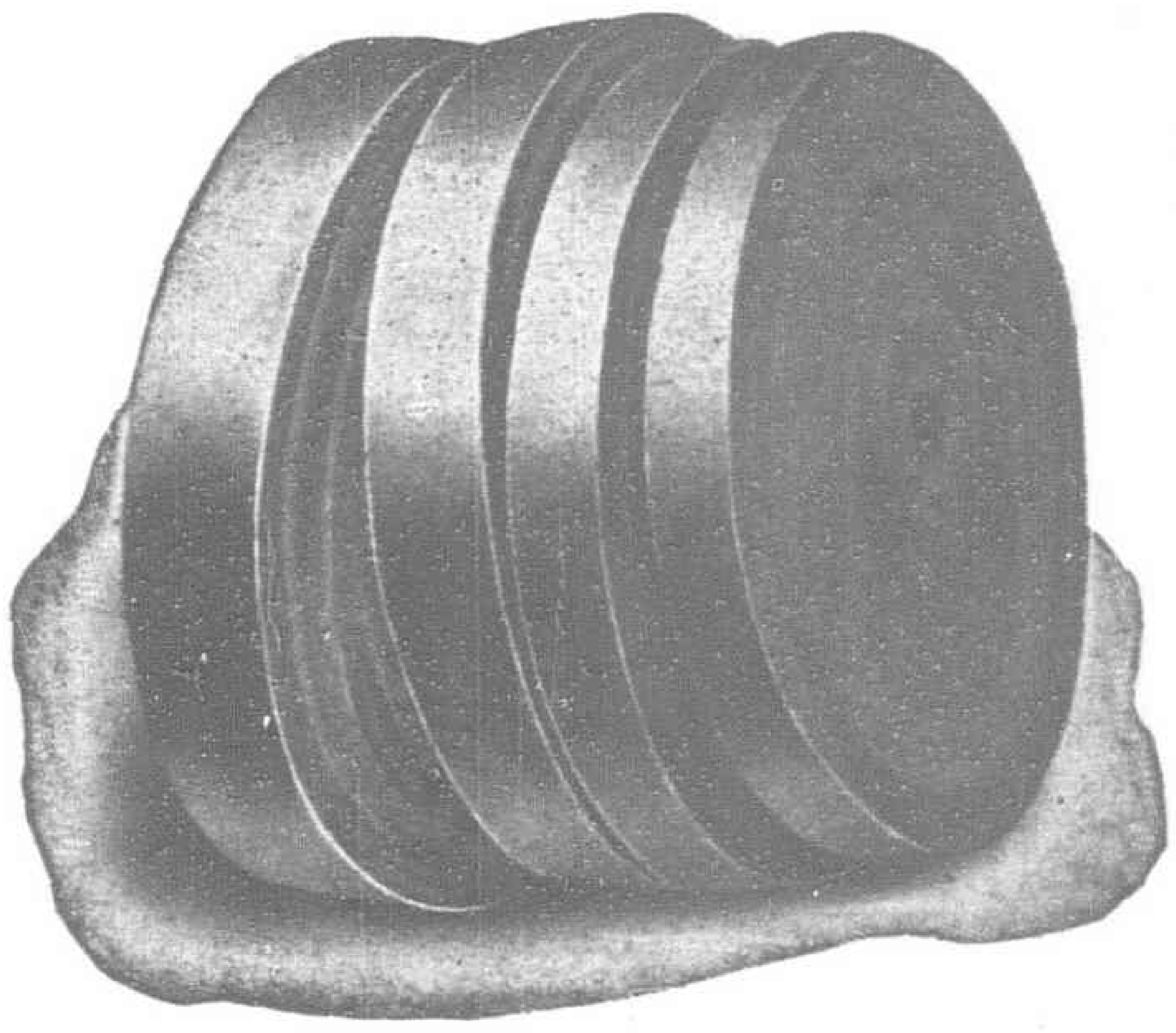

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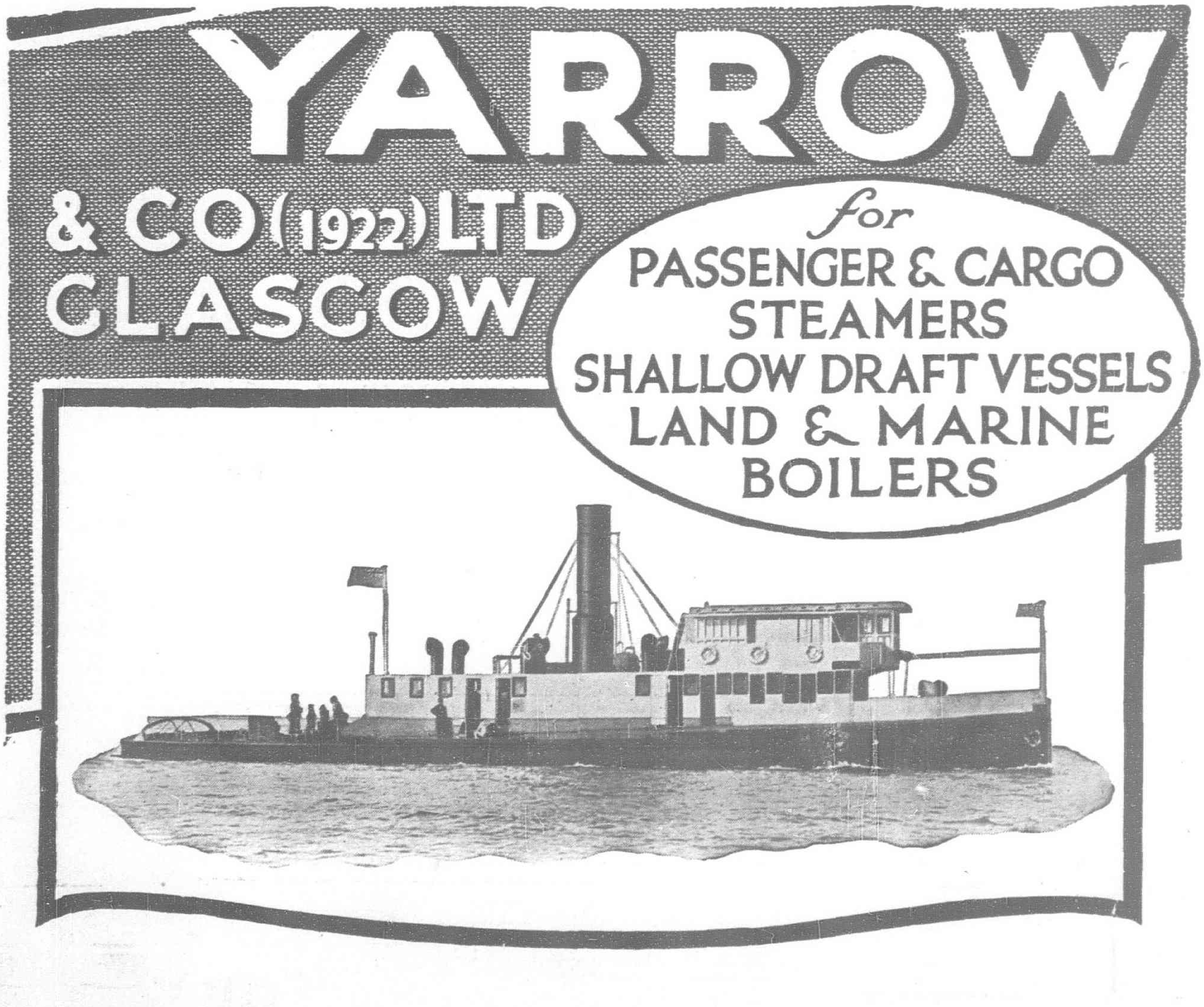

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The Far Eastern Review

ENGINEERING FINANCE COMMERCE

VOL. XIX SHANGHAI, SEPTEMBER, 1923 No. 9

The New Trend of Asiatic Politics

By Geo. Bronson Rea

1. Japan's Position in the Naval Race

THERE seems to be no end to the stories circulated with the object of creating the impression that Japan is not living up to the terms of the Washington naval treaty. After weighing both sides of the evidence we come reluctantly to the conclusion that either a lot of official statements are being made to conceal or, that a propaganda is being carried on in America and Great Britain to use Japan as the smoke-screen behind which huge naval appropriations are advocated to make up for the sums saved by the limitation of capital ships. The facts prove that Japan lost no time in living up to her committments at Washington. Long before the treaty was formally ratified on August 17, she accepted its finality and even when it looked as though France might withdraw, indicated her readiness to carry out its provisions on a three-power basis. Yet the ink had hardly dried on the signatures to the Washington treaties when Japan was accused of circumventing their provisions by forcing the pace in the construction of auxiliary combat craft. Japan, it was claimed, was the only country where naval shipbuilding continued to form an important branch of the national industry. This, at a time when the Japanese shipbuilding yards were practically closed as a result of the treaties, with the government and private shipbuilders confronted with most serious problems arising from the release of surplus workers who demanded as much as two years salary for the privilege of being discharged. Steady progress, it was urged, was being made with the revised scheme of construction adopted in March 1922 aiming to create a powerful fleet of so-called auxiliary craft to make good the loss of strength in capital ships and that this program would mature in 1927 when Japan would possess a splendid and perhaps, unrivalled force of light cruisers, big destroyers and ocean-going submarines.

Present Naval Strength

It is true that considerable activity is being displayed in Japan in the construction of auxiliary craft, but the official figures submitted recently to the interested powers indicate that the 5—5—3 ratio fixed by the treaty has not and cannot be attained by Japan within the time set by her critics. The present strength of the auxiliary surface combatant craft of the United States, Great Britain and Japan is shown in the following table of total tonnages irrespective of the age of the vessels. It will be seen that the present ratio is substantially 5—4—5 and 5—2 instead of 5—5—3:—

Country	Cruiser			Destroyer			Total of Auxiliary Surface Combatant Craft.		
	No.	Tonnage	Ratio	No.	Tonnage	Ratio	No.	Tonnage	Ratio
United States...	23	182,625	1	317	367,388	1	340	550,013	1
Great Britain...	50	259,670	1.42	200	234,960	0.64	250	494,630	0.9
Japan	25	148,170	0.81	100	77,653	0.21	125	225,823	0.41

Auxiliary Surface Craft

The next table shows the total strength of auxiliary surface combatant craft of the three powers at the end of 1927:—

Country	Cruiser			Destroyer			Total of Auxiliary Surface Combatant Craft.		
	No.	Tonnage	Ratio	No.	Tonnage	Ratio	No.	Tonnage	Ratio
United Stated...	10	75,000	1	280	334,921	1	290	409,921	1
Great Britain ...	55	299,830	3.9	201	238,720	0.71	256	538,550	1.27
Japan	28	171,055	2.2	92	104,980	0.31	120	276,035	0.66

According to the original proposal of the United States presented to the Washington conferene, light cruisers shall be replaced by newly completed ships after 17 years from the date of their completion and destroyers after 12 years from the date of the their completion, the vessels thus superseded being scrapped. In the above table, therefore, figures are taken of only cruisers that will not be over 17 years old and destroyers not over 12 years old. The number and tonnage of the vessels for Japan are figured on the assumption that she will complete her replacement program before the end of 1927. Those for the United States are figured out on the hypothesis that she will not undertake any new construction except that covered by her 1916 program, which was to be completed in 1924. The same hypothesis is applied to the case of Great Britain. It is, however, improbable that these two countries will not construct any new vessel before the end of 1927. Therefore, it will be seen that Japan's proportion is likely to be even further within the 5—5—3 ratio at the conclusion of her building program.

Submarine Strength

The original proposal made by the United States at the Washington conference provided that submarines can be replaced by new ones after twelve years from the date of their completion. In the following table showing the present strength and what it will be at the end of 1927, figures are taken of only those submarines that will not be more than twelve years old, no account being taken of future construction by either Great Britain or the United States. It is, however, probable that both countries will continue to build submarines:—

TABLE A. SHOWING PRESENT SUBMARINE STRENGTH

	Number	Tonnage	Ratio
United States	133	77,322	1
Great Britain	68	58,540	0.76
Japan	37	24,377	0.31

TABLE B. SHOWING SUBMARINE STRENGTH AT THE END OF 1927

	Number	Tonnage	Ratio
United States	121	84,900	1
Great Britain	76	68,370	0.81
Japan	67	68,536	0.81

Naval Construction Expenditures

The following table shows the naval construction expenditures under the 8—8 program of Japan and under the revised program:—

	1923 Yen	1924 Yen	1925 Yen	1926 Yen	1927 Yen
Eight-Eight Program ...	147,413,102	147,790,200	143,258,418	113,692,857	115,377,355
Revised program ...	116,262,479	110,000,000	110,000.000	85,000,000	71,054,030

In the past the expenditure contemplated by Japan, under the 8—8 program and authorized by the imperial diet, had been increased by only 20 per cent. over costs of construction in pre-war days. So slight an increase, however, was far from sufficient, and the deficit in construction expenditure had been made up annually by appropriations authorized under a supplementary budget. The government submitted to the imperial diet at its last session a new naval construction bill, which provided for a revision of the expenditure for new construction, as is shown in the table above, and the bill was sanctioned. In that table the margin has been computed with an increase of some ninety per cent. above pre-war prices. Such an ample margin will, it is expected, save the Japanese naval authorities from going to the diet for authority to make additional expenditure in the form of supplementary annual budgets in the future. It goes without saying that the said revised naval construction expenditure includes an item for the conversion of two capital ships into airplane carriers.

Cruisers Under Construction

Japan is now building one cruiser of 5,500 tons each at the shipyard of the Kawasaki Dockyard Company, Kobe, the Mitsubishi Shipbuilding Yard, Nagasaki, and two other dockyards at Uraga and Yokohama, respectively, and one of 3,100 tons at Saseho,—five in all of 25,100 tons total. These vessels constitute a part of the auxiliary ship program and were designed to be attached to the 8—8 fleet, the realization of which has now been abandoned in conformity with the naval treaty.

At the beginning of this year, the United States was completing and constructing ten light cruisers of 7,500 tons each, and Great Britain two ships of 9,750 tons each, two of 7,550 tons each, one of 5,560 tons, two of 4,765 tons each, and one of 4,190 tons, or eight ships in all (according to a table on page 66 of the Naval Annual for 1923) and some of these have since been completed. The table in question also shows that, while the light cruisers already in Japan's possession number 25 of some 100,000 tons, those of Great Britain number 60, representing approximately 310,000 tons.

Japan contemplates constructing, according to her revised naval plan made public by Admiral Kato in July, 1922, four cruisers of 10,000 tons and four of 7,100 tons; also 24 destroyers of 33,600 tons in aggregate tonnage. This program substitutes the auxiliary construction contemplated under the 8—8 program, but the keels for none of these cruisers has been laid down. It is expected, however, to complete this construction by March, 1928.

It is not known by the Japanese admiralty how many ships of the auxiliary class the United States or Great Britain will decide to construct before the end of 1927.

Another Conference Needed

These official figures communicated by Japan to her partners in the naval pact, must have the effect of allaying further doubts as to her good-faith in the construction of auxiliary combatant craft. On the other hand, there arises the question of the number of non-combatant auxiliaries not provided for in the treaty. In regard to this class of vessel each country is suspicious of the other's activities. This defect in the naval treaty provides the loop-hole for unlimited construction of such auxiliaries and vitiates its spirit. British and American writers point to the number of aeroplane carriers, oil, storeships, and other adjuncts to a fighting fleet being constructed by Japan, while the Japanese are nervous over the programs formulated and pushed on by their partners to complete a great fleet of similar craft. The feeling is voiced in Amerrica and Japan that unless this tendency is checked and a stop put to naval base expenditures, another disarmament conference will have to be called to relieve the nations of these heavy and unnecessary expenditures which nullify the spirit of the Washington treaties and continue to impose heavy war burdens on a long suffering people.

2. The New Anti-Japanese Agitation

The Significance of Singapore

The world wide discussion over the establishment of the Singapore naval base reveals that the general Asiatic situation has been little modified as a result of the Washington treaties, and another race is now on to checkmate the possibility of Japan's rise to dominant influence in Eastern Asia. It seems to make little difference whether Japan pursues a militaristic or a pacific policy to work out her destiny; she is certain to be mistrusted. It is generally accepted that the establishment of the Singapore base is aimed directly against a future misunderstanding with Japan, a sort of Anglo-American move for mutual protection. We are asked to believe by British writers that the base will come in handy in the event America is forced to defend the Philippines against Japan or in the event we are called upon to "drive Japan out of China."

It was difficult to believe after the Washington conference that Americans still harbored the idea of a war with Japan, but the same old talk is being revived as a result of the Singapore move and to the many British arguments for and against the base are now added the approval of such high authorities as Admirals Strauss and Rodgers of the American navy. In discussing the possibilities of war between Japan and America at the Institute of Politics in Williamstown (Mass.) Admiral Strauss asked the conference to consider the possibility of war in the Far East in consequence of the attempt of some country to discriminate against the United States in Chinese markets, or the possibility of an attempt to partition China to the exclusion of Americans. The United States then would face war with two or three powers, he said. Professor Blakeslee quoted Bywater and other naval experts who contend that Japan would capture Guam and the Philippines before the American fleet could leave Hawaii and in this event, Admiral Strauss said America would be compelled to fight Japan without a base and any American ship damaged in battle would become a total loss.

The 50—50 Anglo-American Naval Partnership

Admiral Rodgers, chairman of the naval board, taking up the discussion declared that "sooner or later America and Britain would have to join forces in the Far East and if Britain wants to fortify Singapore, let her fortify it as much as she wants and more, the more she fortifies, the better it will be for us. But at present Britain is arrogant and we are meek. The question is whether we are going to join on a 50—50 basis or whether we will retain merely a colonial position. If we own only 49 per cent. of the stock and Britain 51 per cent., that is one thing. If we join on the basis of equality, that is another. Japan driven from Siberia by the inhabitants now realizes that her whole army is insufficient to hold or run the Amur railway. Soldiers guarding the line often disappeared without trace. The Japanese also are sensitive to cold and if they remained long in Russia they would become subjects for Bolshevik propaganda. Japan now has completely changed her policy in China. Having failed to dominate that country by force she now has adopted a policy of winning China by friendly advances."

These remarks would seem to imply the possibility that even if Japan does win the confidence of China through friendship it would be interpreted as another attempt to dominate her affairs to the disadvantage of others. The argument that she might conspire with other powers to partition China and discriminate against Anglo-American trade is evidently inspired by the possible coming together of Russia and Japan and the eventual triumph of Russian plans to pit Asia against Europe. This naturally would bring Germany into the combination at some time or other. Now the mere possibility that Japan might compound her differences with Russia and work together for the advancement of common aims in Asia through some understanding arrived at in the conferences with Joffe, has been seized upon by some writers as sufficient justification for Britain's determination to build the Singapore base. In fact, we are informed that this is Britain's answer to the Goto-Joffe conversations. The fact that Japan is trying to win the confidence of China through friendship is also accepted as being as much of a menace to American interests as though she employed military methods to conquer the country. So either way, Japan is a menace.

Hongkong, the Key Base

Great Britain evidently intends to fully prepare against any possible danger to her lines of communications in Asia and is keeping her powder dry ready for any emergency. We now learn that another supply base is to be established at Trincomalee in Ceylon, and can expect to hear of further heavy expenditures for other sub-bases along the main lines of British imperial communications radiating from the new "Gibraltar of the East." To our way of looking at it, there seems to be considerable white-wash in all this British publicity about their plans in order to divert attention from what after all will remain their main base in the Far East. Hongkong may come within the provision of the Washington treaties as far as official activities are concerned, but its private docking facilities will soon be able to dock and repair a whole fleet at once, and in the event of war it is safe to assume that her shipyard and docking establishments will be taken over by the government. Great Britain is officially living up to her commitments in regard to Hongkong, but it requires no naval expert to sense that private enterprise will carry on and within the next ten years, the South China port will have the largest docking system east of Suez. The growth of the port of Hongkong will legitimately call for these facilities to take care of merchant vessels, all of which can be converted into naval uses within twenty-four hours. The base at Singapore will serve well enough in times of peace to take care of Britain's Asiatic fleet, but in the event of an unfortunate break with Japan, it will be Hongkong with its formidable defenses that will provide the necessary support to a powerful fleet. Within the next ten years Hongkong and Canton will come together, placing the coal of Kwangtung at the disposition of the British for the erection of iron and steel works at Kowloon, and with the completion of the harbor improvements and extension of the present private docking and shipbuilding establishments, Hongkong will become the fighting base for the British fleet in Asiatic waters. Because of its proximity to the oil fields of Borneo and Sumatra, Singapore will retain its prominence as a fuel base, and only if Hongkong should fall, would it serve the purpose for which millions are now being appropriated.

The American Naval Program

On top of all the publicity given to the British scheme of Far Eastern naval defense, comes the announcement that Secretary Denby is asking congress for an appropriation of $150,000,000 to keep the American navy abreast of Japan and Great Britain in the Pacific. If Admiral Rodgers reflects the official view, then the Singapore base fits in with America's plans and sooner or later we must come together in an alliance with Britain for the protection of mutual interests in the Pacific, while Admiral Strauss leaves us in no doubt as to who we must prepare against. The American program for the extension of Pacific bases at Honolulu, San Francisco, Bremerton, San Diego, Panama Canal, Manila, Guam and Samoa, is undoubtedly the answer to the question put forward by Admiral Rodgers when he asked if we were to join Britain on a 50—50 basis. The chairman of the naval board propounded the question which was answered within a fortnight by the secretary of the navy asking congress of $150,000,000, which, being three times the amount appropriated for the Singapore base, probably represents our idea of working with Britain on a 50—50 instead of a 51—49 basis. On top of the American estimates comes the news that France is also preparing to strengthen her Asiatic fleet, which means considerable activity will be witnessed in extending the docking facilities at Saigon and the establishment of submarine and aircraft bases. So we come once more to where the old game that was played in Europe is to be resumed in the Far East. What it is all about, we do not know, unless it is a tacit admission that the Washington conference failed to scrap distrust with vessels of war.

To seek for the reasons underlying this new competition in armaments it is perhaps just as well to go back to the series of articles on British naval policy in the Far East recently published in the *Morning Post* of London.

3. The Bogey

The Japanese Scarecrow Clothed in the Bond Street Style

A special diplomatic correspondent of *The Morning Post* (whose name is withheld) has succeeded once more in obtaining publicity for all the old stock arguments about Japan's problems and policies in the same way that Lord Northcliffe made the welkin ring with his denunciations last year and along precisely the same lines employed by Mr. Louis Seibold in the *New York Herald* the year previous. This new series of articles bear all the earmarks of official propaganda to prepare world opinion to accept the Singapore base as a precautionary measure against the possibility of Japan's domination of China, either through colonization, economic penetration or an alliance with Russia and Germany. Taken in connection with the propaganda so skilfully designed to lead Americans to believe that the base was part of a plan to support our fleet when the time comes for us to drive Japan out of China, and with previous activities of British writers in Peking to bring about a Sino-American alliance for the same purpose, it begins to look as though there existed a set design in certain quarters to force the United States at some time or other to throw down the gauntlet to Japan. Why the United States should assume single-handed the rôle of China's saviour is beyond our understanding, yet there exists ample evidence that forces are at work to precipitate a situation which will compromise us to carry this burden. It was easy enough to understand the motives underlying the campaign directed by Chinese government advisers to create a Sino-American alliance aimed at Japan and to hold the fort at Peking pending the arrival of American troops. It is not so easy to understand the insistance of Americans that their government actively intervene in China either alone or in co-operation with Great Britain. This, certainly, is not Chinese propaganda and is contrary to the best interests of the larger American firms and philanthropic institutions in the country. If this movement fails to represent Chinese or the best American opinion, we must seek elsewhere for the motives, and we return once more to the suspicion that Americans knowingly or otherwise, are, playing the game originated in Peking under Anglo-American auspices.

The latest British outburst against Japan employs many facts which this magazine has invited attention to for several years. There is nothing new in this rehash of old stuff, the arguments employed by the *Morning Post* support our contention that no matter what Japan may do to prove her good faith and satisfy Anglo-American opinion, she will still be singled out for abuse. The same methods which characterized the propaganda of the great war are to be repeated until the hearts of the Anglo-Saxons are fired to the point where they will accept the burdens and sacrifices of another war for the preservation of China as trade market for the West, under the delusion that they are fighting for the salvation of civilization or some other equally effective phrase.

Japan's Population Problem

It is true, as pointed out by the writer in the *Morning Post*, that the great problem of Japan is to find an outlet for her surplus population, and here she has little choice. If the doors of most of the white men's countries in the Pacific are closed to her people and they cannot own land and settle in China, Japan must absorb her increase in home agriculture and industries and seek foreign markets in competition with the West for the sale of her manufactured products. Japan must then look to China for the bulk of her raw materials and a large part of her food supply. She must, of a necessity, cultivate the good-will of China. This would seem to be axiomatic, an argument from which there is no appeal. It is the basis of Japan's present policy and explains her willingness to remedy past mistakes in diplomacy.

Now, there are two schools of thought in Japan on the question of population. Such leaders as Viscount Takahashi and Mr. Fujiyama may be said to represent the element which holds that Japan's need of an outlet is each year becoming more urgent. On the other hand, we have such capable writers as Dr. Washio and such newspapers as the *Japan Advertiser* who deny that Japan is overcrowded. They even go so far as to point to the dearth of domestic servants and the influx of Koreans in order to support their statement that outside labor is now essential for Japan to carry on with. These exponents of Japanese thought assert that the population problem does not exist and is found only in imagination or in propaganda. This element may be right, yet it is difficult to reconcile their viewpoint with the fact that the population of Japan is officially admitted to be increasing at the rate of 6 to 700,000 a year. If this be true, and Japan is taking care of this increase without emigration, it would mean that agriculture and industry are absorbing the surplus. How far Japan can do this if the same rate of increase be maintained indefinitely, is problematical. If no outlet is found, the annual surplus must be taken care of through the expansion of industries and the creation of foreign markets for the sale of their products. Otherwise they must starve. This solution involves the annual investment of an enormous amount of capital in new enterprises. There certainly is a limit to Japan's ability to absorb her rapidly mounting millions and the controversy in the end must simmer down to an approximation of the time when the saturation point will be reached.

Friendly Relations with China Vital

In either case, the pressure will call for increased quantities of raw materials and food products and the bulk of these must come from the nearest source of supply. Although it may be urged that this necessity will influence Japan's rulers to bring China under their control, the dominant sentiment in Japan at this time holds that the best interests of the nation will be served by China's development under the open-door principle, in which American, British and other capital will assure that constant supply of raw materials and food upon which Japan's very existence depends. It is a mistake to believe that Japan's economic penetration of China will in any way endanger the rights or interests of other nations. The field is too large and Japan lacks the capital to exclusively exploit China's resources. The competitor of Japan in China, is China itself. The same bald statement holds good with regard to America and Great Britain, or any other nation aspiring to dominate her trade and industries. As China's industries are developed she will supply her own requirements and then compete with other nations for world markets. Japan alone can never control China's industries and if she is to live and prosper by absorbing her own surplus population, her one hope of survival is to induce by all means within her power, the development of this country by foreign capital in order that markets will be created, in which, by reason of her geographical and other legitimate advantages, she may hope to supply a fair share of its requirements.

Aside altogether from Japan's acceptance of the open door principle and recognition of China's sovereignty, her very existence is bound up in the prosperity and development of her big neighbor. These committments of Japan are a guarantee to China and the world that Japan will never attempt to solve her problems through conquest or military adventures. Japan is sensible enough to understand that such a policy would result in her elimination as a first class power. To follow this road is madness. The Japanese are not mad. Under the protection of these guarantees China is secured against any loss of territories or political aggression. Instead of danger to China resulting from Japan's economic necessities, the shoe is likely to be on the other foot, for as China's industries and agriculture expands and her people regain more and more of their sovereign rights they will more and more be able to dictate to Japan, and the day may come when Japan's industries will be at the complete mercy of China. The time is past when it is possible to create a war scare or justify armament expenditures because of Japan's population or economic problems. Japan will never again permit herself to be placed in the position of inviting the combined hostility of America and Great Britain, so the arguments advanced by the writer in the *Morning Post* to bolster up the need for the Singapore base carry little weight.

Japan's Russian Problem

As there are differences of opinion within Japan concerning the population problem, so there are two distinct lines of thought in regard to Russia—and Germany. The dominant party is essentially liberal and pro-ally, believing that the future security of the nation can be attained and assured only through friendly co-operation with America and Great Britain. This element, represented by the present cabinet, has surrendered all special advantages acquired in the past in order to more fully permit Japan to work in harmony with the other liberal powers. From the time Japan entered the consortium to her acceptance of the principles embodied in the Washington treaties, its government has given every proof of a sincere desire to merit the friendship and confidence of its partners. Nothwithstanding these concessions to world opinion, a bitter publicity campaign has been waged to discredit her good faith, destroy her influence and trade in China and so make impossible any hope of solving her problems through peaceful co-operation in the development of China's resources. Japan's influence at Peking was undermined and her military pacts for mutual defence cancelled in order to bring about the ascendency of a war-lord who was elevated into high power because of his uncompromising antagonism to Japan (a military autocrat who now stands as the one obstacle to a peaceful solution to China's domestic troubles); her attempts to develop Manchuria with the aid of American capital were condemned by American organizations who saw in this an attempt to push forward aggressive designs: there is also sufficient evidence to substantiate the statement that foreign advisers prevailed upon the Peking cabinet to demand the cancellation of the 1915 Manchurian treaty and apply the boycott as a retaliatory measure. Japan has silently watched the Soviet's violation of China's sovereignty in Mongolia, after she had been coerced by the consortium powers into recognizing that this territory constituted a most important part of the Chinese republic. She was coerced into evacuating Siberia under pressure of American diplomacy and opinion and now that the Soviet is once more menacing the peace of Asia, Japan must either prepare to defend her vital interests, or compound her difficulties with Russia.

Japan, the Goat

It is now quite clear that the consortium powers do not intend to exert any pressure upon Russia in order to protect China's sovereignty in Mongolia. This responsibility is slowly being shouldered on to Japan after being manœuvred out of all advantageous strategic positions. Had Japan been conceded a free hand in Eastern Asia three years ago, the Soviet influence would have stopped short at Baikal and an effective check created to their activities in Afghanistan and China. Japan, however, was forced to bow to world opinion and surrender the right to defend herself in the Taonan-Jehol zone against "the menace from the direction of Urga." Japan was penalized and Russia encouraged to resume her old program for annexing Mongolia and push forward her new campaign for bolschevizing China. The movement was then launched to compel Japan to surrender her rights to the key of the strategic situation in Kwantung, Had she meekly complied, as it was hoped, it would have left Russia in complete security to carry forward her designs. Japan would again have been at her mercy through the impotence of China to discharge her international obligations. In other words, after fully protecting themselves in Europe against the eventual comeback of Germany, the powers denied to Japan the right to apply the same principles for her defense against the comeback of Russia. At every step Japan has tried to satisfy her partners, receding and ceding until she has reached the limit of concessions compatible with dignity and security. Any further advance on the part of Russia will call for strong action and in the present state of world politics and opinion, Japan will once more become the "goat."

In the event of a crisis arising in Asia as the result of Soviet activities, Japan can look for no assistance and precious little sympathy from either America or Great Britain, whose altruistic policies towards China and sentimental regard for the "Bolshies" stripped her of all strategic positions on the mainland with the sole exception of the lease to Kwantung and possession of the South Manchuria Railway. Naturally, there exists a powerful element in Japan which objected to these concessions and now decline to permit their country to be made the scape-goat in a war with Russia. In the same way that a similar element in America opposed the conspiracy to railroad their country into war with Japan and brought about a peaceful solution to the issues involved, so there is an element in Japan which demands a peaceful settlement of their difficulties with the Soviet. Surely, this is a most sensible and patriotic stand, yet the evidence keeps piling up that should Japan escape war with Russia by resuming friendly relations, she automatically becomes a potential enemy to her other partners and we are solemnly assured that the Singapore naval base is Britain's direct answer to any such understanding.

Between the Devil and the Deep Sea

If Japan fights Russia in order to protect her vital interests or to maintain the integrity of China in Mongolia, she fights alone. The same old group of anti-Japanese propagandists will see in such a war only one more proof of Japan's determination to dominate China. Every move of Japan would be misconstrued, every official declaration twisted and misinterpreted while Britain and America would stand ready to fight her at the drop of the hat if China's interests seemed in any way impaired. The world would reject as Japanese propaganda any reference to the facts of the past few years and deny that such a war would have been forced by American and British policies encouraging China to disregard her international duties to the extent that the door was left open for Russia to work her will in Mongolia, while a wall was erected along the Taonan-Jehol strip effectively screening and protecting her from interference on the part of Japan. If Japan moves in self-defense, she faces the certain hostility of the world: if she seeks to avoid a clash by a compromise or understanding, she becomes a traitor to her partners, an object of suspicion which justifies Britain in building naval bases at Singapore with the full approval of eminent American naval experts. Under such conditions, Japan hasn't a chance in the world of saving herself, condemned beforehand by a packed jury; damned if she does and damned if she don't.

Japan undoubtedly will take the first opportunity to find a peaceful solution to this problem by compounding her differences with Russia, but such an understanding will never violate or conflict with compromises already entered into. Japan will never accept Russia and Germany as partners in any designs upon China, so the fears which serve as an excuse for the establishment of the great Singapore naval base are wholly without foundation. As long as Great Britain and America live up to their side of the bargain at Washington and place no obstacle in the path of Japan's legitimate peaceful economic development of China, there is little likelihood of any Russo-Germanic-Japanese combination. If, on the other hand, Japan is to be continually persecuted, hounded, misrepresented and blocked on all sides, self-preservation may supercede all other considerations and the people of Japan demand a change of policy that will ally them with powers more sympathetic with their vital needs. Neither the British, American or French governments would ever permit such a situation to arise, no matter how strong the pressure and propaganda to bring it about. So, if the British possessions in India are ever seriously menaced, the foe will not steam down the China Sea through the straits of Singapore, but come tramping through Afghanistan and over the Khyber Pass. Japan will never be a partner in such a war.

4. Japan Holds the Balance of Power

An Answer to Mr. Ozaki's Prophecy of Disaster

We are not surprised to read in the Japanese press that the opposition is preparing to attack the government for its alleged weak-kneed policies which, it is claimed, instead of strengthening is gradually reducing Japan to a position of isolation, pregnant with dangerous possibilities and breeding positive hostilities with other powers. Neither are we surprised to learn that this attack is being made by Mr. Yukio Ozaki, the most fearless and independent progressive in Japanese political life. It is not difficult for Mr. Ozaki to make out a strong case in support of his contentions that Japan stands to-day " a nation without a friend: that in the event of war she would seek in vain for a kind word or a helping hand." He deplores the passing of the Anglo-Japanese alliance and sees trouble looming ahead in China. Reduced to a few words, the burden of Mr. Ozaki's argument is that the policy of concessions has failed to gain the confidence of the other powers, that Japan stands alone, isolated, an object of suspicion and headed towards possible disaster.

Mr. Yukio Ozaki, M.P., interviewed at Karuizawa, the summer resort in Central Japan, denounces the spirit revealed in the appropriation for U.S. Naval Defence in the Pacific

Had Mr. Ozaki made this statement two months ago, it would have been difficult to substantiate, but coming as it does in the midst of a new outbreak of anti-Japanese publicity arising from the establishment of the Singapore base, together with the bitter anti-Japanese boycott in China, he is fairly justified in calling attention to obvious facts. If the Singapore base is primarily aimed at Japan: if it is being created in order that the American navy may use it in the event of war with Japan over China or in defense of the Philippines: if it voices Britain's answer to a Russo-Japanese understanding; in short, if it meets any of the requirements claimed for it, and dovetails with a 50—50 partnership with America, then it would be foolish for Japan to play the ostrich and delude herself into a position of security opposed to all ordinary rules of common sense.

There is no side-stepping the facts disclosed by the publicity over the naval moves of Great Britain and the United States in the Pacific. If the Singapore base is a vital necessity for the defense of Malaya and India against a foe menacing these possessions from the east, the imaginary enemy can only be Japan, operating alone or in alliance with Russia and perhaps Germany, a situation, which, in itself constitutes a reflection on Japan's good-faith with her present world partners. The mere fact that this move is deemed essential for the security of India constitutes sufficient evidence in support of the statement that in destroying the Anglo-Japanese alliance, the Washington conference invited this new menace to Asiatic peace. Peace in the Pacific was assured at Washington. That is undeniably true. A new four-power pact guarantees the security of insular possessions in the Pacific which to a certain extent supersedes the old Anglo-Japanese understanding, but its provisions fail to meet the situation in Asia, the storm centre of world intrigue, the scene of future conflict for empire. Once the insular possessions of the various powers concerned were guaranteed against attack, the conference did the same thing for China. In the hysteria and altruistic concern for salving the open door and the integrity of China, the conference at Washington lost sight that the prime object of the Anglo-Japanese understanding was the defense of mutual interests in Asia: that it was directed against Russia and not America, and that it was forced upon the contracting parties by the secret alliance entered into between China and Russia in 1896, under whose provisions Russia was to make use of China's territory to facilitate her attack upon Japan and advance upon India. The Li-Lobanoff secret alliance was the key to the entire Far Eastern puzzle, the move which finally compelled Japan and Britain to come together for mutual protection. Propaganda directed largely from Peking, added to the uneasiness in the United States over the possibility of a war with Japan, completely obscured the larger issues at stake in Asia by creating the impression that the Anglo-Japanese alliance would bring England in on the side of Japan in the event of war between the latter nation and America. China's advocates pulled the wool over everybody's eyes by declaring that Japan's aggressions were made possible solely by reason of her alliance with Great Britain. If this instrument was annulled, they urged, China could breathe easy and work out her salvation without fear of interference on the part of Japan; in fact, all of China's woes were laid to the Anglo-Japanese alliance. Not once in all the discussions or publicity surrounding this epoch-making conference, was any reference made to events which led up to and precipitated the Anglo-Japanese pact. The truth surrounding the secret Sino-Russian understanding which would have clarified the atmosphere and vindicated Japan and England, was carefully concealed. No importance was attached to anything that China might have done in the past. The originator of all the trouble, was the martyr, the innocent victim of Anglo-Japanese rapacity, unable to defend herself against the machinations of other powers. China's publicists " put it over " the conference. The "iniquitous pact" went into the discard and a new instrument designed for the pretection of insular possessions took its place.

History went back to where it stood in 1900, with Russia hammering at the Gates of Herat and pushing forward towards Peking through Mongolia. India once more faces the traditional menace from the north while Japan is left to extricate herself the best she can from the trap set for her in Siberia and Manchuria. Japan has yielded, point by point, to the wishes of her partners and found her powers of defense circumscribed by the erection of a wall in Manchuria beyond which she could not trespass. The consortium and other pacts deprived her not only of the right to meet the advances of Russia in the danger zones of Inner Eastern Mongolia, but left her helpless in living up to the terms of her alliance with

England for the defense of mutual interests in Asia. The Japanese pressure on Russia's flank was removed, leaving the latter free to work her will in the Pamirs. As a consequence of this diplomatic flub-dub to save poor old China from Japan, the road to Peking through Mongolia was left wide open for a Soviet advance. Japan's power to protect herself against a flank movement in South Manchuria or defend Peking was taken away. In Central Asia the way was cleared for the Russian advance towards India. Japan was effectively isolated, her power of offense destroyed and her strategic defenses weakened.

When the Anglo-Japanese pact went by the board, the way was cleared for Russia to pursue unhindered her set program, and, true to past performances, she lost no time in taking advantage of the opportunity presented by the kindly gentlemen at Washington. Mongolia has again passed under control of the Soviet and a vigorous propaganda launched in Afghanistan to smooth the way for the move towards India. Russia is never in a hurry. She overlooks no opportunity. She is now in possession of the road to Peking, while Japan, her one obstacle, is hamstrung behind the Taohan-Jehol wall. The chessmen are set for the next move. Russia's dear Anglo-American friends are cheerfully playing her hand at Peking urging the Chinese to insist upon Japan evacuating Kwantung and clearing the way for her next advance.

In taking stock of the situation created as a result of the Washington treaties, British strategists realized their isolation in India. They had built their hopes on a strong China taking the place of Japan in their defense schemes against Russia. When it became apparent that China was a poor reed to lean upon, they could not set back the clock or undo the damage. They realized that their old ally was in a tight position and must either fight Russia in due time or come to some understanding over mutual interests in Eastern Asia. The British could take no chances on the outcome of such an understanding, so we have their answer in the Singapore base. The ally whose fleet guaranteed Malaya and India from attack for the past twenty years, now becomes a hypothetical enemy, with America entering into the spirit of the game by strengthening her Pacific bases on a tacit acceptance of a 50—50 basis as suggested by the chairmen of the naval board.

In view of these facts, is it any wonder that wide-awake observers in Japan reluctantly come to the conclusion that their country is without a friend in the world, exposed to the wrath of the Bolschevists on one hand and boycotted and villified in China on the other, because their government refuses to surrender their remaining right to self-defense in Kwantung? Openly designated by American and British naval experts as the imaginary enemy in order to justify their naval expenditures, and suspected of treason to the cause of the West if she compounds her difficulties with Russia, Japan's thinking men cannot be condemned if they now question the wisdom of having ceded everything but Kwantung in order to restore world confidence in her policies.

This undoubtedly is the picture which has inspired Mr. Ozaki and provided the arguments for his attack upon the government. It is difficult to explain away the facts, though it is possible to draw various deductions from them according to the angle from which they are studied. The soldier and stateman will approach them from the strategic angle, and in the present state of world affairs, it is the only sensible way to visualize the future. Mr. Ozaki is not an alarmist. He is doing for Japan exactly what many eminent writers and experts in America and Great Britain are doing for their respective countries, looking far ahead and following present day tendencies to their logical conclusions. These conditions may change. American and British experts may modify their viewpoint, but until they do and there is a let up to this unreasoning antagonism towards Japan and a better appreciation of her problems and policies, it would be foolish for her leaders to close their eyes to the trend of world politics.

Japan has gained many friends since the liberal party took over the reins of government. She merits the full trust and friendship of other world powers. No government has gone to the same extremes to prove worthy of world confidence, but the evidence keeps growing that no matter what Japan may do to play the game according to Western standards, it will be a long while before she can fully overcome the prejudice and suspicion created by years of hostile propaganda. The eminent spokesman for the opposition is undoubtedly well within the facts, but it is difficult to see how his government could have pursued a different policy without completely estranging Japan from the other liberal powers and precipitating the calamity which still looms darkly on the national horizon. The administration of Hara and Kato faced a world led by years of malicious propaganda to distrust Japan's every move, a campaign of calumny culminating at the Paris conference, where it became clear to the most inexperienced observer that peace in Europe would be followed by war in the Pacific. The first duty confronting the liberal government was to modify national policies to meet changed world conditions. To do this, Japan had to surrender many political, commercial and strategical advantages obtained during the war: to withdraw from Tsingtau, from Siberia, sacrifice her rights to defense along the Taonan-Jehol line, and see her prestige undermined at Peking. One result of these concessions is a clear understanding with America putting an end to all talk of war in the Pacific. The sacrifices were worth that, but in compounding her difficulties with America the door was left open for misunderstandings in Asia.

Before the Washington conference, Japan was the potential enemy of the United States. She now becomes suspect with Great Britain and henceforth will be the target for such British propaganda as seems necessary from time to time to unloosen the purse-strings of the British taxpayer for naval expansion and to further their policies in China. It is no fault of the liberal government that Japan finds herself between the anvil of Russia and the Anglo-American hammer. She cannot escape being pounded as long as she seems to stand in the way of Anglo-American co-operation in China. Japan can do nothing at this time to prevent this. She must wait for conditions to change. For change they must, and as long as Japan adheres to her present policy in China, provides no opening for the Anglo-American steam hammer to come into play, and finds an honorable and peaceful solution to her troubles with Russia, she sits on top of the eastern world, holding the balance of power.

G. B. R.

The Trend of Events in China

The Call for a Conference

The sorriest spectacle of recent history is seen in the continued recognition extended by the powers to the marionettes of Peking whose sole function is to perpetuate a fiction that operates to fill the war-chest of their manipulator with the surplus salt and customs revenues released on due dates by order of the legations. This is the real reason for the existence of a so-called government at Peking that has long since graduated from comic opera to a pestiferous nuisance, if not a positive menace. By continued recognition of the Peking collection bureau of the Chihli war-lords the powers have placed their unqualified stamp of approval on Wu Pei-fu's determination to accept no compromise other than submission to his rule at the point of the bayonet. It is an unholy alliance, a most callous disregard for the welfare of a bewildered and stricken people masquerading under the flimsy pretext that China is being permitted to work out her salvation in her own way. It could not be otherwise. Foreigners picked Wu Pei-fu as the "Hope of China" and supported him morally, if not materially, while he drove the Anfu and Chang Tso-lin cabinets from Peking because of their alleged friendship for Japan. Diplomatic support to Wu followed, and on the heels of his victory over Chang came the agitation for a huge reorganization loan to consolidate his power. It is superfluous to allude to the identity of those who supported this obnoxious loan, sufficient to say that Japan blocked it by refusing to participate in any financial advance to China pending unification and the establishment of a government recognized by all factions and provinces. For two years, it may be said that anti-Japanese influences have moved heaven and earth to make their program stick by an unwavering loyalty to the shadowy cabinets which have flitted through Peking in rapid succession as schroffs for the

Loyang war-lord. Wu's campaign of unification by the sword has progressed merrily. Szechuan has been devastated. Honan is wrecked. Kiangsi is filled with northern bandits ravaging the towns and villages. Fukien is the scene of active warfare while upon the heads of the Cantonese has been loosened the furies of civil war in its bloodiest aspects. At any time the struggle may be carried into Kiangsu and Chekiang with the rich loot of Shanghai as the prize of victory. Thousands of lives are being needlessly sacrificed. Industry and agriculture are at a standstill. The wealth of the interior is flowing into Tientsin, Shanghai and Hongkong for safe keeping. Poverty, famine and disease stalks through the land. Development is out of the question and trade is dead. Foreign firms are operating with their backs against the wall, propped up by the banks, hoping against hope that something will happen to turn the tide. Failures follow each other in rapid succession. The outlook is black.

The dissemination of Chinese news is mainly in the hands of anti-Japanese agencies. There is little chance that the outside world will ever learn the true story of the desperate game of international politics played in Peking the past several years with the object of isolating Japan and bringing China under Anglo-American tutelage. Originating at the height of Japan's influence, it first sought to compromise the United States to a war, as the easiest way to destroy for all time any possibility of Japan's domination of Eastern Asia. The campaign was then relentlessly waged to oust the Anfu cabinet and then the one acknowledging Chang Tso-lin as master. Japanese financial support to Peking, it was urged, had split China wide asunder, making unification impossible. The Anfu crowd was accused of selling their country to Japan and squandering the money in fruitless campaigns against the south. Chang, the "uncrowned king of Manchuria," was alleged to be in the pay of Japan, conspiring to restore the monarchy, hence, a traitor to the republic, an obstacle to constitutional government. Tuan, Chang and their satellites had to go, in order to purify Chinese politics and save the nation from Japan. Wu, the Heaven-sent Hope, discovered and acclaimed by the muddlers of Peking as the one simon-pure, hundred per cent. unalloyed Chinese patriot, would chase the Japanese into the Yellow Sea, and with Anglo-American financial and moral support usher in an era of unprecedented prosperity in which railway and road building, industrial development and fat concessions for the insiders would be the order of the day. Everybody but Japan would receive a large, thick, juicy, piece of Chinese pie when Wu came marching home.

Sir Robert Ho Tung, Kt.

The valiant, incorruptible and invincible overlord of the Kin-Han became the pampered pet of the Peking legations, the napoleon who would carry China to her place in the family of nations so carefully prepared for her at Washington. The oracle sat in his yamên at Loyang and pulled the strings which manipulated the movements of his puppets at Peking. His cabinets came and went, eight in one year, and as each new group filed its weary way through the metropolitan ministries, begging a bone here and a crumb there in addition to the regular hand-outs in the shape of salt and customs revenues released by the legations, the joy of the anti-Japanese clique became unconfined. The legations were playing their game and no matter what move Wu might make, his continued recognition was assured.

To every call for a conference that might lead to a compromise and unite the country under one rule, the Heaven-sent Hope announced that he alone held the mandate from on high to govern, and if the others did'nt like it, they cold lump it ; he would unify them with the Krag. It is difficult to account for an attitude opposed to all accepted ideas of Chinese physiology, and can be explained only on the hypothesis that Wu is so certain of foreign support which carries with it enough salt and customs revenues to pay his favorite divisions, that he can afford to flout public opinion and press forward his military campaigns for the subjugation of other provinces. Bereft of the salt and customs surpluses, Wu would have to accept an invitation to a conference or face the gradual decline of his authority through inability to squeeze further funds from a people already squeezed dry. In view of these conditions it is fair to state that Wu's stubborn determination to woo the country with the Krag, is made possible solely because his Peking puppets enjoy the recognition of the legations and receive their contributions to his war-chest from the salt, customs and other revenues.

There is no difference between the present situation and that of three years ago. Instead of a pro-Japanese set of officials functioning in Peking their place is taken by an anti-Japanese group masquerading as a government of sorts for the sole convenience of the diplomatic corps. Civil warfare goes merrily on, increasing in horror with each passing week. Instead of the Anfu clique stamping out liberalism in the south, we now have Wu Pei-fu in arms against the field, carrying the war into all the provinces and with special ferocity against Sun Yat-sen and his little band of devoted parliamentarians fighting to establish a government responsible solely to the people. There was always some hope of a compromise in bygone days: now, there is none. To satisfy the inordinate ambitions of Wu, fire and sword are to be carried to the farthermost confines of this vast country, untold thousands of peaceful lives will be sacrificed; villages, towns and countryside sacked, its women ravished and its young men carried away by press gangs into slavery. And then, after establishing his authority over the eighteen provinces of China proper, Wu will have to reckon with Chang, of Manchuria, just now sawing wood and preparing against the day when the conquering legions of Wu will cross the dividing line of the Great Wall.

Unless our powers of observation and deduction are at fault, it is here the curtain will be rung down on the great international political drama whose first act was staged in Peking during the great war. Once Wu invades Manchuria and Japan's vital interests in the operation of the South Manchuria Railway are placed in jeopardy, the climax will be reached. It should not be overlooked that Wu has publicly announced his determination to drive the Japanese out of Kwantung, that his puppets raised the validity of the 1915 treaty, or that he personally encouraged the boycott movement by issuing instructions "not to interfere with the will of the people." After he finishes with the eighteen provinces and starts to discipline his Manchurian antagonist, he is due for the surprise of his life.

If the above picture faithfully portrays the situation, then the moral to be drawn from it is obvious. If the time should arrive for the victorious Wu to send his legions into Manchuria, it is logical to suppose that he will enjoy the full confidence and support of his foreign sympathizers, and should this sentiment be shared officially by their legations, it is not difficult to forecast the result. The show-down which the combination has been moving heaven and earth to bring about with Japan would be precipitated in a manner not included in their calculations.

For the best interests of all concerned, for the happiness and welfare of a broken people, and the preservation of world peace, foreign meddling and intrigue in China should cease. The anti-Japanese conspiracy hatched in Peking during the war and given its impetus through the confidential publications of an international association, has gone far enough. It has already complicated and made difficult any solution to China's troubles and stands as a barrier to harmonious co-operation on the part of the powers in the application of any plan to remedy the situation. As long as Japan is a member of the consortium and her representative enjoys an equal voice in the deliberations of the diplomatic corps in Peking she can be depended upon to oppose and nullify all the pet schemes devised by the Anglo-American combination to advance their own special interests in this country. In the matter of a loan to Wu Pei-fu, it was the liberal cabinet of Japan which saved liberalism in China and blocked a deal which would have once more elevated a military autocrat to supreme power: Japan stood out against the use of foreign troops to round up the Lincheng bandits: Japan opposed foreign intervention in the affairs of China when the nationals of other powers demanded drastic action: Japan opposed the employment of a foreign military police force for guarding the Chinese railways. Japan is standing squarely upon the letter and spirit of the Washington treaties, scrutinizing all moves which might seem to be subversive of China's sovereign rights or an impairment of her administrative independence. Japan holds the whip-hand. Her enemies have presented her with the weapons to fight them with. Japan was compelled at Washington to surrender many special advantages in China and affix her signature on the dotted line of a treaty carefully drafted by Anglo-American experts to safeguard China against exploitation or violation of her sovereign rights. Japan signed without reservations. Now when the nationals of the other signatory powers call for a new deal, she simply says: "You made the rules of the game, play your hand."

As the champion of China's rights, Japan can afford to sit tight while other foreigners call for action, which, if listened to by their governments, would nullify the Washington treaties and destroy China's administrative independence. The chinafied Anglo-American element have no complaint coming. They dealt the cards from a cold deck. Japan is playing her hand to their lead.

If the international political game is to be played out under existing rules, it will not be long before the positions of the powers in regard to China are reversed, with Japan occupying the rôle of China's best friend in the place of those now holding that questionable advantage. At any rate, it is clear that internal conditions will change for the worse when the victor in the internecine struggle crosses the Rubicon and throws down the gauntlet to the overlord of Manchuria. Is the game worth the candle? Will unification by the Krag bring peace and happiness to China or advance foreign interests in this country? Decidedly not.

If continued recognition to Wu Pei-fu and the Pei-yang freebooters is not traceable to any anti-Japanese policy, then the time has arrived for the legations to lend their support to the movement initiated in Hongkong for a round-table conference to settle the differences of the warring *tuchuns*. If a central government is to be established without plunging China and perhaps the civilized world, into greater horrors; a compromise must be effected. The first step towards this end is a conference of the Chinese leaders. Last year the Loyang war-lord rejected the invitation of Sun Yat-sen to a disarmament conference. Wu is still the stumbling block to unification, the menace to peace. Wu is maintained in power by the recognition of the legations. The road to peace lies in a withdrawal of this support. A new call for a round table conference has been sounded by Sir Robert Ho Tung from Hongkong. Sun Yat-sen, Li Yuan-hung, Chang Tso-lin and others have accepted the invitation.

The Washington conference brought the blessings of peace to the Pacific but left the door wide open for events in Asia to undo its work. The peace of Asia and the world is assured only so long as Japan's economic life is not imperilled. Self-preservation will force her to defend her vital interests with all the resources at her command if Wu Pei-fu carries his campaign of unification by the sword into Manchuria. The Washington conference will have miserably failed if this climax to the present trend of events is not forestalled. Sir Robert Ho Tung points the method. His call for a round table conference of the warring leaders of China is as vital to the attainment of the objects of the Washington conference as it is to restore peace to this unhappy country. If the call is rejected, it is then squarely up to the four great powers directly concerned to instruct their ministers to act and act promptly in support of his plan. A peaceful solution to China's difficulties will be followed by a peaceful solution to many dangerous international political problems in Eastern Asia.

G. B. R.

The Trend of Missionary Endeavor in China

The Paramount American Interest: Trade or Uplift?

AT the 12th annual conference of British missionary societies held at Swannick during the last week of June, some interesting particulars were made public in regard to the comparative contributions of Great Britain and the United States for foreign missionary work. To China alone, America sends every year upwards of $9,000,000 gold, against £325,000 contributed by England. At the conference it was said that a marked tendency exists in China and India to form national Christian councils of independent churches coupled with a desire for education that amounts to a passion. Another point stressed was that present-day students preparing for a missionary career express a wish to work independently of missionary societies in the spread of Christianity or in connection with undenominational bodies. Students also complain of "unrestrained and unintelligent propaganda in season and out" and the younger men and women are taking up courses which deal not only with medicine and education but with agricultural work and economics.

Here we have food for much thought. The figures given as the amount contributed by America are undoubtedly confined to expenditures through organized missionary bodies excluding educational and hospital endowments, Y.M.C.A. contributions, and the payments from the Boxer indemnity. Nor does it include red cross, famine relief or other charities. These figures coincide with our own rough estimate which reveals that a sum equivalent to approximately twice the total profits on American trade with China is returned annually as a free gift for the uplift of its people.

The British conference accentuated the fact that the difficulties surrounding purely religious propaganda in season and out, are each year becoming greater and missionaries now realize that the regeneration of China must come through education and a higher standard of living. The tendency, therefore, is to transform the religious worker into an educational, industrial, and economic agent, subordinating the spiritual ideal to general uplift in order to prepare the minds of the Chinese for the acceptance of religious principles.

The expenditure of ten or more million dollars yearly through missionary bodies backed by the political influence of the churches, gives to this element the preponderating voice in shaping the Far Eastern policy of the American government, a policy, which, under all administrations, determines the selection of the minister at Peking. This truth is emphasized by a passage in Mr. Morganthau's memoirs in which he describes how President Wilson rejected his request to be appointed minister to Peking, because his race and religion constituted a handicap in dealing with the Christian missionary bodies, whose interests in this country were paramount. Under these conditions, the welfare of our philanthropic organizations completely overshadow those of the mere trader, and in any issue affecting friendly relations between China and the United States, it is natural that those who command the greatest political support should influence the policy of the state department. In many cases it will be found that financiers, manufacturers and merchants whose agents are struggling against overwhelming odds in building up a profitable trade in their products with China are the most liberal contributors to the organized missionary societies, and again, there are many amongst this element more concerned over their educational endowments than in promoting their own business.

As long as the activities of this element are confined to purely religious propaganda, commercial interests have no right to voice a protest, but when they depart from this fundamental sphere of usefulness and encroach on economics, industry and agriculture, it comes within the sphere of business. If nearly twice the entire profits of our China trade are to be turned over to missionary societies for improving the general economic conditions of the Chinese as the first step towards their religious conversion, it would seem that the government should have some voice in the expenditure of these funds.

It is difficult to conceive how a missionary student equipped for a career that will enable him to better the economic conditions of the Chinese can achieve practical results without in some way becoming an advance agent of business. If the Chinese farmer is to be taught better methods of cultivation and native industries are to be improved, modern equipment and tools must be employed as an object lesson, and the instructor should be in a position to either sell direct or influence the sale of the particular implements used in his demonstration work. If we are to reach the spiritual heart of the Chinese through economic uplift it would be only fair to insist that our missionary activities produce tangible results on the profit side of the trade ledger.

Ten to fifteen million dollars is a huge sum to be expended annually in a religious propaganda whose ultimate success depends largely upon the betterment of living conditions. The thought naturally arises that if only half this sum was expended under governmental or commercial supervision, the results obtained would be far greater than if left to the individual ideas of religious enthusiasts temporarily transformed into economic uplifters. Five million dollars annually would maintain over a thousand economic experts in all lines of agriculture and industry, whose activities would contribute more towards improving the condition of the natives and preparing his mind to accept the teachings of Christ than the present system of proselyting. At the same time it would open up a market for American products that in a few years would more than justify this diversion from traditional missionary activities.

There has been much loose talk about co-operation for the advancement of American interests in China but this has never included the element which reaps the major benefits from all other national activities. When the missionary bodies now tacitly admit that success in religious propaganda can be attained only through economic and educational uplift, the time has arrived when a large part of their work should be co-ordinated with other organizations having the same end in view. If the American people are to continue to hand over an amount equal to twice their China trade profits for the attainment of a religious ideal through economic development, they should have some assurance that the funds will be expended along lines that will bring material as well as spiritual results.

Otherwise, a large part of our contribution for the economic uplift of China while paving the way towards the ultimate goal of the church, will represent a voluntary tax upon our people for the promotion of competitive trade interests. We endorse the fundamental principle that no thought of material gain or reward should accompany a donation for purely religious work in non-christian lands ; yet at the risk of being misunderstood we advance our belief that if the desired end can be attained only through education and betterment of economic conditions, it is a duty we owe to ourselves and to the faith we profess to make every effort to safeguard the resources which alone enables America to give so lavishly of her wealth for the propagation of her ideals. If we are to spend fifteen millions annually for this purpose and the beneficiaries place their orders for tools and materials with competitors, our mounting assessments for missionary work will gradually develop into a huge fund for undermining our China trade and drying the sources of the golden stream which now flows so freely into the collection plates on missionary Sundays. This idea may be interpreted as narrow, mercennary and unchristian, but any unbiassed study of the facts will inevitably lead to the same conclusion. Religion is one thing, economic uplift another. One is idealistic, the other practical. The two cannot well be merged together under the direction of religious enthusiasts with any hope of success. There exists also a reasonable doubt as to whether the bettering of economic conditions will influence the non-christian to change his religious viewpoint. Certainly, it has not had this effect in Japan, for after eighty years of strenuous missionary endeavor in that country, the church harvest is placed at 300,000 converts.

The crowning glory of the missionary in Japan is found outside the church, in education, hygiene and social welfare work. The christian example has been followed by many of Japan's great leaders who retain their faith in buddhism and national traditions. The results of eight decades of evangelical labors in Japan must therefore be sought not in the actual number of converts enrolled in the church, but in the revolutionary changes in buddhistic religion caused by contact with the christian model. It can hardly be said that christian missionary work in Japan has elevated to any considerable extent the economic or industrial condition of the people. The forces which have carried Japan to her present place in the front rank of manufacturing nations have little or no connexion with the spread of christian doctrine. If economic uplift and education plays such an important part in the propagation of christianity, then Japan's record in Korea and Manchuria merits the highest commendation from missionary bodies, yet it can hardly be contended that the material prosperity brought to the farmers of Manchuria has influenced in any way their outlook on religion.

It may be that the Chinese mind reacts differently towards christian propaganda but it is fair to assume that in the long run the results will be very much the same as in Japan. China will never be wholly converted to christianity. The best that can be hoped for is that she may follow in the footsteps of Japan and mould her religious outlook on western methods and devotion to ideals. Mere contact with christian nations through trade, diplomacy and education will exert the greatest influence towards this end. It may be accelerated by the expenditure of huge annual appropriations from the churches at home in order to maintain thousands of evangelical workers in the field. It may also be expedited by economic and industrial development providing a brighter outlook for the masses, but if the goal is to be reached by this method, it is our candid belief that the funds now contributed for religious propaganda could be better employed in creating industrial opportunities that will alleviate in part the terrible struggle for existence which now stands as a barrier to the advance of christianity, civilization and progress in this country.

Is America An Eleemosynary Institution?

Are Americans Preparing Huge Pacific Naval Bases to Maintain a Losing Trade Market or Defend their Philanthropies?

THE commerce reports reveal that in eleven months of the 1923 fiscal year, our total trade with China was $243,000,000 with exports of $88,000,000 and imports of $155,000,000. We bought from China in this period $67,000,000 more than we sold to her. At least 50 per cent. of our imports and a large percentage of our exports pass through the hands of foreign firms. There is no gain to the national wealth from such transactions. With the exception of the petroleum and tobacco companies, nearly every general trading firm in China has experienced severe losses these past four years, driving many into bankruptcy and the hands of receivers. Those who survive have pulled through by additional assessments of new capital or are carried by the banks. It can be fairly said that at least fifty per cent. of the total American business with China has been conducted at a loss for the last four years.

For the sake of argument we can allow a five per cent. profit on the total value of our exports to China (say $95,000,000) for 1923, so the gain to the national economy is $4,750,000. A similar profit may also be taken on half the volume of imports through purely American concerns (say $160,000,000), which gives us another $4,000,000, or a total of $8,750,000 from our entire Chinese trade, against which stands our contribution of $9,000,000 for missionary work alone. This wipes out the profit on trade. Add to this the endowments for schools, colleges, hospitals and similar institutions, contributions for the Y.M.C.A. and Y.W.C.A., red cross relief work, flood and famine prevention and other charities, the Boxer indemnity remission, the Rockefellar Institute upkeep and special calls on Americans for the maintenance of their own schools and churches in the treaty ports and the total may well run up to another $6,000,000 or $15,000,000 a year for general uplift work in China from America alone, about five per cent. on our total trade with this country.

With this as a basis, add the $40,000,000 gold with interest now owing to American firms by the Chinese government—with no prospects of being paid for the next five years: to this, add the losses of American firms in China for the past four years: the contribution of 300 odd American firms who answered the call of the booster to come to China and capture its trade by weight of numbers: the wallop received by the Philippine National and other American banks on exchange, not to mention the heavy burdens imposed upon all American firms to keep their heads above water while the Chinese indulge in their prolonged Doneybrook Fair, and the sum total will approximate $80,000,000. Add this to the $36,000,000 for missions spread over the past four years, then the $24,000,000 for other charities and we have a grand total of $140,000,000, or an average of $35,000,000 a year as our contribution to China for this period. We can deduct from this the five per cent. profit on our actual exports to China of approximately $5,000,000 a year and we find that the people of the United States are out about $120,000,000 in the past four years. With the average annual export profit it will take many weary years to wipe out the red ink figures; double the profit to ten per cent. and the result is the same. It is true that the above figures are only approximate and may be modified ten to fifteen per cent. one way or the other but if we have even approximated the truth, it is time the American business man and his government took steps to verify them.

These figures tell us that America's main business in China is philanthropy, and protection to our eleemosynary institutions. Whenever there is talk of a possible war over China, Americans are told they must fight for the protection of a trade principle, for the right to do business on a basis of equal opportunity with other nations. When, however, the American business-man calls upon his government to protect American lives and properties in this country and enforce the observation of treaty rights on the part of the Chinese he is invariably opposed by the element whose interests are best served by the application of a kid-glove policy. The protection of American trade rights against possible encroachments of other nations on the open door doctrine, is the favorite bogey conjured up to fire the hearts of Americans and force through huge naval appropriations, but when these same interests are injured by China herself and our traders clamor for protection, their cry is drowned by the voice of the missionary and professional uplifter demanding non-interference. The result is that American business which provides the funds for our philanthropic activities, is banged over the head whenever it tries to assert its rightful position. American trade with China will never be worth fighting for as long as these conditions prevail.

The American people should be made acquainted with the facts surrounding this phase of their activities in China. If our naval authorities put through an appropriation of $155,000,000 for the extension of Pacific naval bases in order to work on a 50—50 basis with Great Britain and be prepared against a possible war with Japan over China, let us at least know what we are expected to fight for.

Are we to continue to throw away millions for the protection of a losing trade proposition, or are these extra drains upon the taxpayer to be charged against the already enormous sums expended for civilizing, educating and bettering the economic conditions of a people, who, to date, have demonstrated little gratitude in return for our charitable contributions towards their evolution from paganism into christianity?

This is a matter that should command serious consideration on the part of Americans. Our presentation of facts as we see them, is not to be taken as an argument against missionary or educational work in China, but as a stimulus to a fuller investigation that may lead to the publication of an official balance sheet showing the relative financial position between trade and philanthropy. We fully concur with the thoughts expressed by Mr. F. W. Stevens in his remarkably able presentation of Chinese conditions set forth in the following article. We accept Mr. Stevens as the spokesman for American interests in China and unqualifiedly endorse his opinions, but at the same time we venture to say even that this expert has failed to examine the balance sheet. More than any other American, Mr. Stevens speaks for the great financial interests who desire to see China started along the road to prosperity and greatness and stand ready to convert their good-will into practice just so soon as China herself reaches a position to accept their proffered help.

Our one comment on the program outlined by Mr. Stevens is, that the educational uplift of China through American contributions is assuming such great proportions that the cost of carrying on and extending the work will increase by leaps and bounds until it becomes a serious drain on our charity. Furthermore, the total of the sums involved in endowing these general uplift institutions will completely overshadow our trade and compromise the government to a policy that discriminates against its development. The point we desire to emphasize is that if the United States is to assume the task of regenerating China and return for uplift purposes at least twice the profits from our trade, the facts should be made known, so that in any discussion or program for the expansion of armaments in the Pacific, we will have some idea of the real issues at stake. Christianize, civilize, educate and uplift the Chinese to any extent that our charities will permit, but let there be no misconception of our true position when congress is called upon to vote huge naval appropriations or the manhood of the nation is asked to take up arms for the preservation of a trade we will not protect when injured by the recipients of our generosity.

Recent events fully justify the statement that the American government will take no action other than perfunctory diplomatic protests for the protection of American lives and properties in China or to safeguard their trade and treaty rights, neither will it approve of any measure on the part of other powers for the protection of their vested interests that involves any impairment of China's sovereignty or administrative independence. Aside from the traditional reluctance to intervene in the affairs of other nations, there is reason to believe that this benevolent policy is dictated by missionary and philanthropic organizations who fear the effect of drastic action on their own usefullness. Coincident with these events, our naval authorities revive the talk of war with Japan and ask congress for missions to strengthen our Pacific bases in order that our trade interests in China can be more readily defended against any nation or group of nations who might violate the doctrine of the open door. It is a remarkable picture. We take absolutely no steps to protect the interests of our traders when jeopardized by China herself in order to safeguard our eleemosynary privileges, but when hundreds of millions are required for naval expansion and an excuse is needed to keep the people keyed up and prepared for war, we are asked to believe that our wonderful trade opportunities in China warrant the extra burden of taxation and make necessary the greater sacrifice when the call to arms is sounded!

Such a policy is pure, unadulterated piffle, the inevitable fruit of an incessant, interminable and ubiquitous publicity campaign originating in 1899 with the open door doctrine to preserve the Chinese from the consequences of their insincerity, instability and general inability to do anything for themselves and leading up stage by stage through successive administrations and the rapid expansion of our missionary activities to the point where a large and influential element in our country has deluded itself into the firm belief that the salvation of China, educationally, spiritually, morally politically and financially, together with the obligation to defend her against all foes, real and imaginary (with the exception of Russia) is a heaven-sent duty imposed upon us in order to establish, disseminate, propagate and perpetuate our ideals, beliefs and institutions amongst a people steeped in their own self-sufficiency and traditions and centuries removed from our standards and conceptions of life, government and morality. It may be, and we do not deny that it is our christian duty to contribute from our stupendous prosperity all that we can spare for the uplift of the Chinese and the betterment of their economic conditions but when this philanthropic obligation assumes such proportions that it calls for the formulation of a state policy to the detriment of other more important interests, then the time has arrived to call a halt while we get a better perspective on what it all means and where it will all end.

The conquest of China through education is a task that calls for such enormous annual contributions of capital that no one outside nation should lightly take up the burden. It is a task calling for united action between all the great powers, including Japan. No other people at this period of great world depression and uncertainty can hope to compete with America in propagating their ideals amongst the Chinese, and it stands to reason that notwithstanding our protestations of disinterestedness other nations will incline to the belief that we are taking advantage of their present helplessness to bring China under our influence. Our example has already compelled others to remit their share of the Boxer indemnity for educational and industrial propaganda, which simply means that the struggle for dominating China has been removed from the sphere of international politics and brought under the direction of organized philanthrophy.

Education, The Only Hope for China

The Philanthropist's Answer China's Present Problems

By Frederick W. Stevens

The following article was originally an address by Mr. Stevens, who, from 1920 to 1923, represented the American Group of the China Consortium in Peking. The address was given in New York before a group of about fifty men (the guests of Charles R. Crane, formerly American Minister to China) who are actively interested in China and especially the Peking Union University; and it has been published in pamphlet form by the China Society.

REPUBLICS are governed by public opinion. This need not, of necessity, control through the ballot, but it must control, or the word republic is a misnomer. Public opinion is the prevailing sentiment of the articulate portion of a given community. It is not, therefore, of necessity the opinion of the majority of individuals. Every republic has passed through, if indeed it does not still remain in, the state where ruling public opinion represents not the numerical majority but the numerical minority. A true republic, one which has the really progressive tendency, must look toward a day when the majority shall be articulate, and therefore ruling; but it may fairly claim the name republic long before that day is reached.

A Republic Only in Name

Since the fall of the Manchu dynasty in 1911, after a reign of about two hundred and fifty years, and after a monarchical form of government lasting for thousands of years, a so-called republic was formed, and China is to-day called a republic. But the Chinese people were not well prepared for a republican form of government, and few who are adequately informed will deny that China is now a republic only in name. On the other hand, she is no longer a monarchy, and I believe she will never be again. She is ruled, in fact, by military lords. Her so-called central or Peking government is impotent in more than half of the territory of China. Her so-called parliament, lately reconvened at Peking, after several years' eclipse, is not representative, is not respected, and is openly charged with being governed by selfish and corrupt motives, and is largely powerless for good.

Frederick W. Stevens

Her representatives are unable to bring about disbandment of her armies, constituting a millstone about the neck of each succeeding cabinet; and there has been a new cabinet every few months. The armies are not national armies. Her military lords, each independent of the other, seize legitimate revenue when they can and levy illicit revenue, to keep their armies together and to maintain their individual power. The civil wars of China are usually the result of personal ambitions, not of national purposes.

The only public revenue handled rightly is that which is under foreign domination; and such revenue is mortgaged beyond its capacity. The so-called central government is bankrupt; it has been compelled to allow many millions of foreign and domestic debts to go to default, and the wages of its representatives and employees in almost all branches are long unpaid. The power of the provinces as independent political units is growing, and in violation of treaties made by the old Peking government, these provinces are levying taxes on imported goods, while the Peking government is powerless to stop these violations.

The continued recognition of the Peking government by the foreign powers, which I do not criticise, is the chief reason for its retaining the semblance of power. The unification of the provinces, the creation, in Peking, or elsewhere, of a contral power recognized by all China, seem a long way off. International control by the powers, advocated by many, would, in my opinion, end in a huge failure; and it will probably never be attempted. China must and will work out her own political salvation. And in China, as in every republic, real or nominal, the basis of success must be an informed, enlightened, and moral public opinion. It is only righteous and aggressive public opinion that frightens bad rulers, that restrains wicked officials, that produces a good government, that secures even-handed justice to all.

China a Pretty Safe Place

Against this array of unhappy facts, we may set the fact that persons and property are perhaps on the whole as safe from violent seizure in China as in our own states. There are roving bandits in some parts of China, and foreigners are sometimes seized for ransom, as we know by recent reports, but, when I read of assaults and robberies in our own states, I think China a pretty safe place. There personal assaults and robberies, burglaries and street brawls are rare.

A Fiction Unmasked

I promised myself recently to take advantage of an early opportunity to denounce publicly a story that seems to have reached every man and woman in the United States. I have scarcely conversed as much as ten minutes with anyone who has not visited the Orient, without being asked, "Are the Japanese and Chinese honest?" And when I say "Which ones?" I am always met with something like this: "Well, I understand that the Japanese bankers cannot trust their own people and have to engage Chinese to run their banks."

There is no truth in the story, and there never has been. The *Japanese banks have rarely, if ever, had Chinese in their employ.* The story ought to be widely denounced in this country, for it does an injustice to the Japanese; and the Chinese, who, as a people, are doubtless as honest as any other people, do not need this false testimony as to their integrity. The story probably originated from the circumstance that when two British banks, which had long operated in China, opened branches in two cities of Japan, their leading compradore in China installed Chinese employees in these branches.

The Question of Population

There has never been a reliable census of China. It has been a habit of writers and speakers about China, during the last forty years or more, invariably to refer to her 400,000,000 people, an unchangeable figure despite the great number of births and the mortality in China. Although skeptical about even the approximate accuracy of the figure, I find it difficult to make myself such a heratic as would be involved in using some other figure. I assume that there are about 400,000,000 people in China.

China a Farmer Nation

According to those well qualified to make the estimate, about eighty per cent. of all the people of China—which means, let us say, upwards of 300,000,000 people—get their living from labor connected quite directly with the cultivation of the soil. There is a very wide distribution of the ownership of land. There are said to be in China about fifty million distinct land holdings,—ownerships in fee. This fact is considered by many as an insurance against Bolshevism, the advocates of which are said to be distributing large quantities of Bolshevistic literature in China. In southern China, a plot of ground approximately the size of an ordinary city residence lot here, is a "farm," and its products keep a family alive. In northern China, the units are often much larger.

The Poverty of China

"Keep it alive," is what I say, and is all I mean. It seems to be true that a large part of these millions live year after year on the edge of starvation, seldom or never having enough food to satisfy hunger, much less to provide a reserve supply to meet the contingencies of famine, due to flood or drought or other cause, that frequently arise. Too much is demanded of the land. It is a constant fight, by those who get their food from it, to obtain material necessary to produce the requisite soil fertility.

The lack of demand for labor, to which I shall refer later, forces resort to the soil by more people than the soil can well support. Government provides little in the way of drainage or other artificial aids. The farming methods of thousands of years ago are generally followed, yet practically nothing in the way of advice and assistance as to modern methods of farming is furnished by any governmental agency. Practically all that is done in this direction,—instruction in soil fertility, plant diseases, seed selection, animal husbandry, etc.,—is by the Christian missionary colleges.

The Labor Problem

Another ten per cent., perhaps fifteen per cent., of the Chinese people, which means in the neighborhood of fifty million people, constitute the laboring class, other than those engaged in agricultural work. These are the artizans, the factory laborers (there are only a small number of the latter) the coolies, servants, and manual workers of all classes. These millions as a rule do not own the hovels they occupy, and they also live on the edge of starvation. Their pitifully small earnings seldom allow them to feed themselves well, to say nothing about saving up anything to meet the needs of worse days than the common run. Life for them has no luxuries and few comforts, and, in our sense of that word, none. "Home" to them means squalid, almost bare quarters, with little or no heat in cold weather. Hot water is a luxury. Cold water is not carried to them by pipes, but is bought in small quantities, out of their pitifully small supply of coppers, from the carts of the water vendors; and to make hot water requires fuel, which for them is very scarce and costly, often to a prohibitive extent, and always to an extent which limits its use to the very minimum. Clothing from head to foot is the simplest imaginable by anyone, and probably more simple than can be imagined by those who have not visited Oriental or tropical countries. Those who know only poverty as it exists in this country have little idea of poverty as it may be. Within a few steps of any place in any city of China, you can be shown poverty of a depth quite beyond your previous imagination.

The Problem of Illiteracy

I have been speaking of the two classes who with their families constitute a total of about ninety per cent. of the Chinese people, perhaps more. These people are nearly all illiterate. By well informed people, those who can read and write are estimated for all China at not more than ten per cent. of all the people, and often at only five per cent. It should be remembered, however, that illiteracy does not of necessity connote lack of intelligence. The court of the Emperor Charlemagne was illiterate, as was the emperor himself, but this condition was due to circumstances, and has never been understood to show a lack of intellectual ability. The Chinese have great ability in the direction of learning what is taught them.

It can hardly be expected, however, that people who can neither read nor write can have much part, if any, in the creation of that righteous and aggressive public opinion that will smash public evils. Indeed those illiterates naturally know little or nothing about the political conditions and developments that surround them, however much they may be unknowingly interested in them. Public opinion is the product of the articulate classes, the educated classes.

Native Buoyancy

Despite all the poverty existing among the peasants and the laboring classes of China, the limited possibility there to find enjoyment in life according to our view, these people as a rule are a good-natured people, a peaceable people, a temperate people, a law-abiding people, a people who endure their lot with wonderful patience and fortitude. Indeed, they know no other life, these sturdy industrious people, who are as willing to work long hours as laborers anywhere and who, according to American engineers speaking from large experience with Chinese laborers and with laborers in other parts of the world, make as good laborers as any people in the world.

The Chinese Deserve a Good Government

Such a people deserve a good government, one that will bring them more of the comforts of life; and some day good government, and more comforts, will come.

Despite the unhappy political conditions, the good qualities possessed by the masses of the Chinese people, inspire hope among China's foreign friends, and create the belief that a better day is coming. I share in that hope and belief. The responsibility of the educated classes to see that that day is hastened is immense, but is not, I fear, commonly accepted by them. If it be possible to weld into a real republic, a nation of 400,000,000 people, largely illiterate, spread over an area approximating that of the United States, speaking many dialects not commonly understood, and with no history or background to fit them for the republican form of government, the Chinese will some time accomplish it, but perhaps only when an entirely new generation has come, a generation governed by new principles, and creating righteous and aggressive public opinion, overcoming the selfishness, the corruption that now governs so large a percentage of the educated class in China's political affairs. The best men in China, both Chinese and foreign, look to such public opinion for relief, partial or complete, sooner or later, from the curses that now beset her.

China's Three Great Curses

There are three great curses which I would mention. One is found in the worse than useless armies of a million or more men, which keep China in turmoil. There is grave need of a public opinion strong enough to compel the disbandment of a large part of them, and intelligent enough to devise an effective method for accomplishing such a disbandment, itself a difficult task.

Another is the growing use of narcotics encouraged by at least some of the military lords because of the illicit revenue it provides them. China has lost much ground in recent years in dealing with this evil.

The third is the prevailing corruption among the officials, made up altogether of the educated classes. Mention of it cannot be avoided in a statement of the true situation, but I pass over the harrowing details. This evil will never be done away with, except as the result of education that breeds character, that results in righteous, aggressive public opinion so widespread that it will break up this deep-seated evil. You may say we live in a glass house ourselves, on this subject; but, as I know our history, we have never suffered with this evil as China suffers.

Of course, I need hardly say that there have been and still are notable, honorable, and highminded men in Chinesep ublic office, men far above the practices I refer to, who deplore the evil.

The Cause of China's Poverty

Why is it that in China, a very large part of whose people are ready, willing and anxious to work and capable of doing good work, there is so much poverty?

It is because there is little demand for labor in China. I often think it a pity that the demand for labor, particularly domestic labor, which is so great in this country, and the supply of such labor, which is so abundant in China, cannot be allowed to meet, to the advantage of the people of both countries. The supply of labor is so great in all parts of China, and the demand so small, that a Chinese laborer who receives on an average per day an equivalent of ten cents in our money, is among the very fortunate; and with that pittance he often clothes and feeds, to the limited extent I have mentioned, several people, old and young.

Why is there so little demand for labor? Largely because China lacks a government that protects Chinese in the establishment and operation of industrial enterprises,—enterprises that would produce an ever increasing demand for Chinese labor and lessen the poverty that is so general. Instead of governmental protection of those who attempt to conduct manufacturing and other industrial enterprises, there is, too often if not generally, official extortion practised upon them; and consequently there is little extension of industrial enterprises in China, outside the limited areas which have some measure of foreign protection, such as the so-called "concessions" in Shanghai and Tientsin.

With the political conditions such as I have outlined, it is not remarkable that the pending industrial revolution progresses slowly, so far as purely Chinese enterprises are concerned. But, despite these conditions, enterprises under proper protection are making surprising headway.

How Can China's American Friends Help?

What can the foreign friends of China, those who believe in the brotherhood of man, who believe that a bad condition such as exists in China is harmful to the whole world,—what can they do to help?

1. Open Opportunities for Practical Business Experience to the Chinese Students in America

By the return of the surplus from our share of the Boxer indemnity, we have brought to our shores for education thousands of the young men and young women of China. We have generously opened to them all the facilities of our institutions of learning; but this is not enough. They need in addition the practical contacts with business and industry which alone can fit them for the task which await them. Given these contacts they should be ready to lead in the difficult work of developing China's great, natural resources—but without the practical knowledge which only such contacts can give, it is vain to expect of them the certain touch which means success. China's problems are practical problems, and in the presence among us of over 2,000 Chinese students we have an opportunity to serve China, and at the same time to serve our own interests. We should at once take steps to insure to every Chinese student of serious purpose a chance to learn, by practice, how practical men meet practical problems. This can be best accomplished by taking them into our industries. Our own rewards will be practical rewards; for we shall then have in the expanding markets of China men who appreciate the essential soundness of American business and American business methods.

2. Get Behind American Missionary Educators

I know of no better way for individuals to help China than by helping to increase the opportunities of the arising generations of Chinese to obtain education of the right kind—the kind that takes into account the moral side of life—the kind that breeds character, the kind that teaches that citizenship carries with it public duties as well as personal advantages, and what those duties are; the kind that will produce a determination on the part of the educated classes to see that corruption in the government service is smashed; that armies are disbanded and that the government is run for the benefit of the masses; the kind of education that is being offered in the primary schools, the middle schools, the colleges and universities, carried on under missionary auspices, in charge of as unselfish a lot of people as can be found anywhere in the world. These institutions are all too limited in their physical ability to reach the Chinese who need their help, and are eager to have it.

I have come to believe that America's greatest contribution to China, greater even than America's political friendship, is the work of the American Christian missionaries in China. This statement may indicate the importance I attach to the need of moral regeneration which must precede any great political and industrial improvement. In all China there is not a single organization, on a scale of importance, that aims at moral improvement, or is calculated to bring it about, that is not traceable in its origin to the Christian missions. I have inquired among all kinds of people from all parts of China for such an activity of non-Christian origin, without finding one.

One who engages in an effort to learn what is the matter with China, and what is the remedy, whatever may have been his former attitude toward religion, cannot fail to become interested in religion as a factor in China. The Chinese are a non-religious, not an anti-religious, people. Neither Buddhism nor Confucianism nor any other of the Oriental religions is any longer a motive force in China. A distinguished scholar, who spent a long period in China, has recently declared:

"Instead of carping at missionaries, we should remember that they have been almost the only ones in the past with a motive force strong enough to lead them to take an active interest in Chinese education."

I regard the Christian universities, colleges, academies, middle schools and primaries, with their nearly 250,000 Chinese students, as most potent factors in fitting China for taking her proper place in the world drama.

At one of the leading play houses in New York city, in a play that has had a long run to crowded houses, there is a character supposed to represent a Christian missionary in one of the South Seas, and I suppose it is accepted by many who see the play as representing the missionary type. By chance, I saw the play a few nights ago. According to my knowledge of missionaries in China and Japan (and I have seen much of them, and learned much of their methods and work) the portrayal in this play is a scandalously false one. I believe that with the most diligent search, extending over any length of time, carried on by those most eager to find justification for the portrayal, no such character would be found in all China, nor in Japan, nor in the South Seas.

The men and women engaged in Christian missionary work in China and Japan are well educated, mostly college graduates, well-bred, high-minded, very sensible and practical-minded people, as I believe any fair-minded man, religious or otherwise, with knowledge of the missionaries and of their methods and work, will say. They are doing a work of far-reaching and vital importance, and with an unselfish devotion far above praise. Sometimes I wonder if there may not some time travel up and down this great land a Chinese John Wesley, or better still a hundred of them, arousing to a high pitch the moral sense of the people, as John Wesley aroused the English people long ago.

If China's educated men as a class have not the inclination and the courage to stand for the right, there is not much hope for her; if, because of fear of personal harm or personal disadvantage or because their moral sense is weak, they withhold support from men who are trying to do China good service, and with creditable success, then the worst has not yet come to China. And if the people of the United States do not realize the immense value of the work which their missionary educators are doing in China, they should be made to realize it; for China's problems are, to a large extent, the problems of the world in general, and of the United States, in particular.

For two and a half years, I have watched in China for signs of hope, signs of the coming of that all-important righteous aggressive public opinion upon which depends China's future, and the future of liberal government in Asia, for China is the test case. I have been often discouraged, disappointed; but I have never lost hope. I believe in the future of the Chinese people because I know what they are; and, despite their errors and their inevitable failures, I desire to help them, and to see my country help them. Therefore, I face the facts, the evil with the good, and desire my countrymen to know both. If they are enabled to understand China as she is, they will then be the better able to help her to become what she should be, politically, economically, and spiritually a great republic.

The Trend of Events in the Philippines

The High Cost of Altruism

THE message of Governor-General Wood to the Philippine legislature on the operation of the Philippine National Bank comes as a timely document to supplement the analysis of America's Far Eastern policies presented in the preceding articles. The Philippine National Bank was organized during the war as a depository for government funds and to perform the functions of an agricultural and commercial bank. Instead of seeking to justify its existence for the joint development of American and Philippine business, it was turned over to native politicians for the exclusive promotion of personal and insular interests. A great opportunity for advancing American prestige in the Orient was thrown away in the frantic rush to finance and exploit native enterprises on the top wave of the war boom and when the inevitable crash came the national bank was buried under a mountain of worthless paper. For twenty-five years Americans in the Orient have been pulling themselves up by their boot-straps, telling the world about their plans to capture the trade of Asia over the heads of competitors. They could see that British, French, German and Japanese business in China rested on the secure foundation of national banks specially created for its benefit. For all practical purposes there banks were colonial institutions, backed by the full weight of their home authorities, designated as depositories for colonial funds, and employed as instruments for advancing the policies of their respective foreign offices through Chinese loans. The establishment of a similar American bank was vital to the success of our trade and prestige with the central government of China.

Had the American authorities remembered some of their own publicity arguments about making Manila the distributing centre for American products destined for other Eastern Asiatic countries, they would have utilized the Philippine National Bank as the instrument to push forward such a worthy program. As a semi-official Far Eastern bank with headquarters at Manila, managed

The Governor-General of the Philippines and his Capable Assistants

Major-General Leonard Wood

Lt.-Col. Peter Bowditch

Lt.-Col. Gordon Johnson

by men familiar with exchange and other special phases of Far Eastern trade, enjoying the confidence and financial support of the Philippine and American governments, the Philippine National Bank would have soon taken its proper place in finance by the side of the Hongkong & Shanghai Banking Corporation, the Banque de l'Indo-Chine, the Yokohama Specie Bank and the Banks of Chosen and Taiwan, the two great semi-official Japanese colonial institutions whose operations cover the Orient. In commenting on this situation, we do not underestimate or wish to criticize in any way the splendid work of other American banks who have struggled against most adverse conditions to establish their footing in this field, but who are handicapped in their freedom of action by a directorate sitting in New York and influenced by the daily fluctuations of the American money market. Such banks could never serve the same purpose as a semi-official colonial bank designed to advance American interests in this part of the world through participating in loans to China for general railway and industrial development. What the Hongkong Bank has accomplished for national prestige with the full support of the British government, could have been duplicated by a Philippine Bank, working with the American government for the furtherance of American interests.

Hand in glove with the routine business of such a bank would have gone the plans for the creation of a free port or zone in Manila, with its terminals, bonded warehouses, subsidiary steamship lines and other activities which would have made the Pearl of the Orient the centre of American trade in Asia. With these dreams ever before them, Americans in the Philippines set out to build up a billion dollar trade with the home country, yet when the great opportunity arrived, they permitted the Filipinos to create and direct a national financial instrument for the exclusive exploitation of insular enterprises whose prosperity hanged entirely on war-profits from a duty free home market.

The Filipinos, it may be urged, were justly entitled to control and operate a national bank for the exclusive development of their own trade, industries and resources without interference on the part of Americans ; on the other hand, we hold to the opinion that as their prosperity is largely derived from the remission of duties on Philippine sugar and tobacco (a free gift taken from the pockets of the American people), some reciprocity was due to their benefactors. The Filipino is prone to overlook this obligation and claim for himself all credit for insular prosperity. It is only fair, however, after accepting this preferential position under our tariff laws to insist that he should co-operate with us for the advancement of our trade and prestige in the Orient. It is not enough for Americans to look forward to the time when our exports of manufactured products to the islands will repay in part this $20,000,000 yearly contribution towards the prosperity of our wards. The price of our philanthropy should at least be an honest and loyal co-operation. The rule should work both ways.

However, we realize that such thoughts are unworthy and place us outside the philanthropic pale. After all, the Filipino cannot be censured for this selfish attitude. As the twig is bent the tree's inclined. From the day we arrived in the islands, the native was led to believe that we were not there to exploit them, and to prove our words we enacted laws which closed the door to the entrance of American capital. Americans were most emphatically not in the islands to promote American trade. We were there first, last and always in a philanthropic capacity, a good-natured big brother who would act as trustee for their posterity safeguarding them against exploitation until such time as we uplifted them to a plane of equality with the white man and educated them to manage their own affairs preparatory to full independence. Under no possible circumstances were Americans expected to reap any pecuniary benefits from their experiment in colonial government. We enacted the land laws which preserved their inheritance from passing into foreign hands and then protected them against the cheap labor of China. In pursuit of our altruistic policy we opened our tariff doors to their principal products and took from our treasury an annual amount which might have been well utilized in other ways at home. And then we handed over to them the revenues and finances of the islands to play with through the establishment of a nice little national bank, all their own, in which Americans were excluded from participation in management. We gave them everything, even to the one instrument that would have made American trade dreams come true. They were like a child with a new toy. They laughed and cried over it, hugged it and kissed it, fondled it, rocked it to sleep and then woke it up and jumped on it, banged it with a club, ripped it open and pulled the stuffing out of it. What they did to it is told in the message General Wood sent to the Philippine legislature sometime in February and not made public until August 17 when it was released by the American executive over the protests of the Filipino leaders. The document comes to strengthen, confirm, uphold, justify, commend and in all other ways endorse the words of wisdom contained in the findings of the Wood-Forbes report.

That the Filipino leaders should have remained silent and opposed publication of the message is quite understandable after a perusal of its text and we agree entirely with the opinion of the governor-general that the time had arrived for the people of the islands to know how their money had been handled and where responsibility for the great losses rests, losses and mismanagement which have made it necessary for the government to issue additional bonds for approximately P.100,000,000, and increasing the national debt to this amount.

Fortunately for the islands, for the Filipinos and for American prestige throughout the Orient, the bank's losses of more than P.72,000,000 are guaranteed by a benevolent group of nice old gentlemen sometimes known as the government of the United States. For them such a loss is a mere drop in the bucket compared with our charitable expenditures in China. Every two years our church-going public and millionaire philanthropists cheerfully contribute an equal sum for bettering the conditions of the Chinese, and, in addition, dictate the government's policy in any critical situation affecting our relations with China. China can go bankrupt, default on her loans, drive American firms to the wall and violate her treaties, but the administration that would dare to call them to book by any application of force, would be swept out of power at the next elections by the united opposition of every religious, educational and charitable organization in the country.

As we fit together the pieces of the Far Eastern puzzle we cannot close our eyes to the picture already exposed to view. The strategic significance of the Philippines will overshadow its economic importance for the next half century, yet the native political leaders continue to cry for an independence that carries with it such onerous international obligations that only a very rich, prosperous and strongly armed people could hope to comply with. The aspirant for the Katipunan presidency in his deep solicitude for the rights of posterity has defeated General Wood's proposal for the development of a rubber industry, which analyzed, tells us in no uncertain words, that the Filipinos are opposed to any scheme that will bring in American capital for the development of insular resources. They are willing to accept, in fact, they are praying and hoping for an independence guaranteed by the presence of an American fleet with its base in Manila, but most unwilling that their benefactors should reap any pecuniary rewards from business that might in any way recompense them for the cost of protection. Such, in brief, is the reward of twenty-five years of altruism, and, in any discussion over the future of the islands, there will always be found an influential element at home who would gladly shoulder the costs of such a one-sided protectorate and submit meekly to the impact of the Katipunan boot on their southern polar extremity.

When the pieces of the puzzle are fitted together we see on one side vast preparations to strengthen our defenses in the Pacific in order, so we are told, to co-operate with Great Britain and utilize her Singapore base in a war with Japan for the defense of the Philippines or the salvation of China. Two of our leading admirals endorse this program and the secretary of the navy asks congress for an appropriation of $155,000,000 to carry it out. On the other side, the still hazy picture is gradually developing along lines which convince us that the above war-like talk and preparations are justified not for the defense of any trade principle, equal opportunity, open door or preservation of China's or Philippine independence, but solely for the privilege of enforcing our right to continue in business as an eleemosynary institution. When we add the cost of our experiment in the Philippines (including the sum total of our free gift in the remission of duties on sugar and tobacco) to the $150,000,000 invested these past four years in China, there is no mistaking the ultimate picture slowly taking form as the pieces of the puzzle fit into position.

G. B. R.

An Orgy of Mismanagement

The Story of The Philippine National Bank

" A Violation of Every Principle which Prudence, Intelligence or Even Honesty Could Dictate "

The Governor-General Message to the Philippine Legislature

" Gentlemen of the Legislature :

" In my message delivered at the opening of the present session of the legislature I said,—

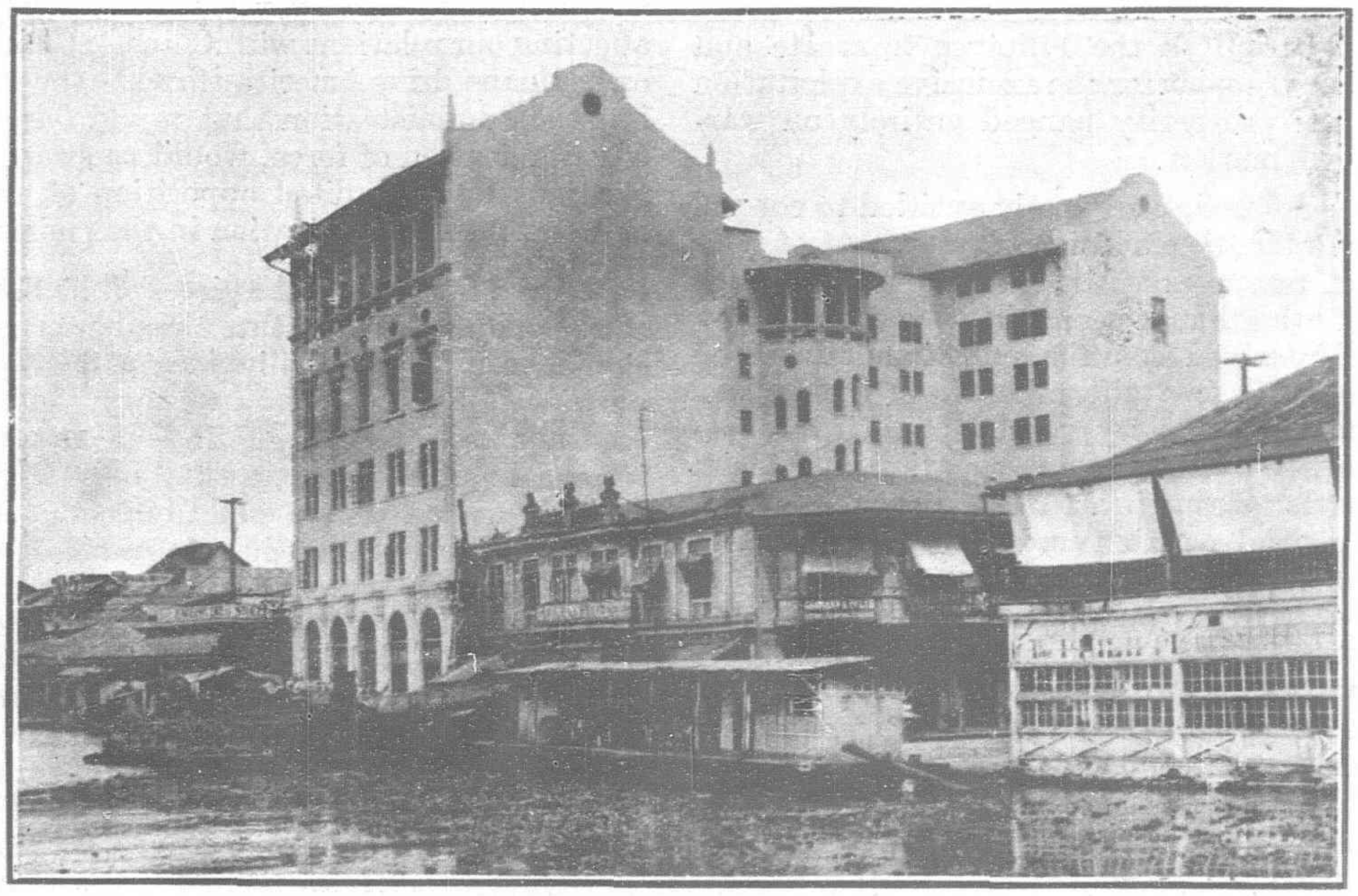
" 'A full statement of the general financial condition of the government, including the condition and operations of the national bank, will be transmitted to you as a special message in the near future."

" Although the final returns from the various bureaus concerned are not yet available it appears that the revenues for the past year were slightly in excess of the estimates. Actual expenditures, however, were considerably in excess of revenues collected, the difference being made good by the partial repayment of government deposits by the national bank.

In Limit of Safety

" On the same basis of taxation the prospects for the present year, as far as can be judged at the present time, are even more encouraging. It is apparent that with the rigid economy of the well-balanced budget for 1923 we will find ourselves well within the limits of safety.

"However, in accomplishing this many vital public activities have reduced to an undesirable minimum. We are in great need of a larger allotment of funds for education, health, and sanitation, to secure which new sources of taxation must be devised in such a manner that the burden will be equitably distributed. Special provision was made by the last legislature through the issue of bonds for irrigation, port works and certain other public works. These bonds are being sold only as actually meeded and every effort is being made to place them on the market in such manner as to yield the largest returns. Care must be taken that the proceeds of the sale of these bonds are used only for the specific purpose designed. They should be in no way confused with funds devoted to similar purposes but which are a proper charge against current revenues.



Pasing River Front of The Masonic Temple Building at Manila, the first floors of which were occupied by the Philippine National Bank

"The heavy losses of the national bank were largely responsible for the increase of our bonded indebtedness which is now up to the limit prescribed by congress. During the past year bonds in the sum of $23,000,000 were sold to provide funds for the re-establishment of our currency system upon its original basis. Fortunately the natural course of trade had brought exchange to par and the indications are that we are entering upon a period in which the balance of trade will be in our favor. The revised system has, therefore, been placed in operation under favorable conditions. There is now behind every treasury certificate in circulation the full face value of the certificate in gold or silver coin. The gold standard fund, for the main tenance of the parity of the peso, is recognized to be smaller than is desirable but it is as large as the limit of our indebtedness would permit. Provision has been made, however, for a gradual increase of the fund under which it will reach a desirable maximum. In the meantime safety is assured by the provision for the issue of temporary certificates of indebtedness in the possible sum of $20,000,000. Business may, therefore, proceed upon the assurance that the parity of the peso is no longer a matter of question.

Additional Burdens

" The issue of bonds for the above purpose together with the issues yet to be made for irrigation and other public works imposes an additional burden upon the government in the way of interest and sinking funds. This will necessitate rigid economy as well as an enlargement of our revenues. It is part of the price the government has had to pay for its policy of entering the field of business. While this has been undertaken with the best motives it has entailed enormous losses due to the bank, the railroad, the coal company, and the national development company, all of which are a continual drain upon public revenues. The true condition of these enterprises is not often apparent because of exemption from taxation, interest, etc. I am now endeavoring to obtain reports which will reveal the exact extent to which the government is involved in these enterprises as well as the extent to which it may become liable in the future. The operating losses of these concerns are in reality government subsidies and should be shown as such.

" It is the present policy to withdraw gradually from all such undertakings and leave the field open to private capital and initiative, and the recommendations I have made from time to time with reference to encouraging the development of our agricultural and other natural resources have had this in mind. I trust the legislature will provide the means by which such a policy may be carried out.

The Philippine National Bank

"The national bank presents one of our most serious problems. The first reliable report on the examination of the bank, rendered in the fall of the year, 1920, showed that the instituation was in a dangerous condition. As a result the bank was placed under its present management in January, 1921. Although the banking and business world was aware of the situation the general public remained in ignorance.

"One of the first efforts of the special mission, which arrived a few months afterward, was to determine the exact status of the bank. For this purpose the well-known firm of Haskins & Sells was employed to make a thorough examination which took nearly a year. The essential facts of the preliminary report of this firm were made known through the report of the special mission, and for the first time the people were given reliable information as to the approximate condition of the bank.

" The final report of Haskins & Sells was not received until last June. In view of the condition revealed by this final report, and in order that we might proceed with a greater degree of assurance of the facts, I deemed it advisable to have their findings checked. Accordingly Special Bank Examiner Ben F. Wright and National Bank Examiner Leo H. Martin, men of mature experience, have made a thorough revaluation of the bank's assets.

Reports Transmitted

" I now have the honor to transmit herewith, for your information the final report of Haskins & Sells as of May 19, 1921, together with the report of Messrs. Wright and Martin upon the reapportionment of the bank's assets as of June 30, 1922. The national bank is a creation of the Philippine legislature, founded with, and operated almost entirely upon, government funds belonging to the people. It is important, therefore, that the people should know the facts as to its stewardship.

" The report of Haskins & Sells shows that the bank, as of May 19, 1921, had incurred losses in the approximate sum of P.75,089,000. The report of Messrs. Wright and Martin places the losses at P.63,091,000 as of June 30, 1922. To this amount must be added the losses written off by the bank between the two dates in the sum of P.11,600,000, making a total of losses as of June 30, 1922, of P.74,691,000 as compared with the estimate of P.75,089,000 by Hankins & Sells.

" It is evident, therefore, that the government has lost its entire investment in the capital stock of the bank, P.32,398,000, and in addition some P.30,693,000 or about 64 per cent. of its P.47,543,000 deposits in the bank. Not only is this true, but the remaining assets, including a large amount of doubtful assets, are tied up solidly in frozen loans and investments and must remain so indefinitely. Further, the bank was carrying practically no reserves behind its P.81,675,000 deposits and some P.30,756,000 circulating notes.

P75,000,000 Loss

"After six years of operations the government finds that its venture in the banking business has cost it approximately P.75,000,000. This is a convincing demonstration of the universally recognized fact that governments cannot successfully conduct business enterprises of this character.

"Under the conditions above set forth there can be no question as to the insolvency of the bank. In accordance with the ordinary rule of law it would have been my duty to close the bank as soon as this condition was clearly revealed. It is unjust for the government to fail to enforce its own laws against an institution of its own creation while enforcing the same laws against private institutions. In following such a course private capital is unjustly discriminated against and the foundation of our business prosperity, which must rest upon private initiative, is undermined. However, the conditions have been exceptional, and I have felt for this and other reasons that it would be unwise to resort to the clearly indicated legal remedy of closing the bank, certainly not until after the legislature had been given full knowledge of the situation. On the other hand, I have sought in the meantime to protect the interests of the government and the public in the bank. Fortunately the public is aware that the government is in effect morally and legally responsible for the bank through its ownership of some 92 per cent. of its stock. The situation is thus relieved of any element of danger to depositors or holders of the bank's circulating notes.

Steps Detailed

"The efforts of the board of control were first directed toward securing accurate data as to the actual condition of the bank. Second, shortly after assuming the duties of my office a committee was approinted under executive order number 54, composed of Miguel Unson, undersecretary of finance and then president of the bank, E. W. Wilson, general manager, and Special Bank Examiner Ben F. Wright, to coordinate the interests of the government and the bank. The committee has rendered valuable services in assisting the board of control to formulate a general policy for the bank's operations, and in bringing about a closer supervision of the bank's affairs in behalf of the government's interests. And finally, a most earnest effort has been made to secure a board of directors composed of the most reliable and competent business men who would conscientiously discharge the duties imposed upon them by law.

"Under the present management improved banking methods have been installed, the personnel reorganized and a good deal accomplished in obtaining additional securities for the protection of loans formerly granted, but in spite of these efforts it has been impossible to overcome the damage wrought by former mismanagement. Most of the liquid assets have been converted into cash. Between January 1, 1921, and June 30, 1922, approximately P.30,000,000 of deposits were returned to the government which has thus enabled to function under considerably reduced revenues. Large sums have also been reinvested by the bank in an attempt to work out the involved affairs of various individuals and corporations indebted to it. It is doubtful whether the real condition of the bank has been improved by so doing.

General Venancio Conception, President of the Philippine National Bank

In General Wood's Message to the Philippine Legislature President Conception is characterized as an asture Politician with only slight tolerance for Americans or things American, a strong partisan and not a banker either by training or inclination. During his three years administration every American but one (a subordinate) was eliminated with the result that there was "not a trained banker or a man trained in bank detail among them, and these to handle P300,000,000 of values)."

Business Restricted

"The outcome of the above operations has been to place the bank in a position where it is able to transact only an insignificant banking business with the public. It is now able to do little more than finance in a very restricted manner the involved business of its debtors. Other patrons have been forced to transfer their business to other banks. The national bank, as shown by the report of the insular auditor, is now operating at a considerable loss.

"Experience, here as elsewhere, has proven that it was a mistake to combine agricultural relief with commercial banking. The two functions have little in common. The underlying fallacy of the national bank was that it encouraged speculation in the handling and marketing of products rather than assisted in their production. The promotion of agriculture was the main original purpose of the bank and yet it was completely dwarfed by the commercial activities which brought about its final undoing.

"At the present time the efforts of the bank are largely directed toward working out the affairs of various commercial interests which it has fallen heir to, such as sugar, oil, tobacco, etc. The success of the bank sugar centrals is dependent upon a continuation of present high prices which is at best problematical; upon the retention of the preferential tariff rates on Philippine sugar; and upon obtaining from government operation a degree of success which universal experience has shown is not generally forthcoming. Up to the present time the bank centrals, as a whole, have failed to meet their interest payments. In the case of the oil mills the situation is even less hopeful. In fact it is considered practically hopeless by the board of directors of the bank. Private oil mills are anxiously awaiting the abandonment of government operations as the only solution of their difficult situation. Old established tobacco manufacturers are gravely concerned with the use of public funds in direct competition with their business.

Forced Into Business

"As the result of government ownership and control, in an effort to prevent losses, the government has been forced into an increasing number of strictly business ventures in which public funds are being invested in competition with private capital to the great detriment of the latter and the introduction of a discouraging uncertainty in the affairs of business generally. It is a serious question as to how far the government is justified in using public funds in competing with those who are heavy contributors to the revenues of the government.

"All of this is contrary to the policy of the home government which has the real and permanent interests of the islands at heart, as stated in my former message,—

> The home government has expressed through the secretary of war the opinion that the insular government should be gotten out of business as rapidly as practicable. I concur in this opinion and long ago transmitted the views of the secretary of war and my strong concurrence therein to the president of the senate and the speaker of the house.

"The outstanding circulation of the bank presents another very serious situation. On December 28, 1922, there were outstanding P.32,127,108 of those notes with practically no reserves behind them and protected only by frozen assets. It is impossible, therefore, for the bank to redeem them in lawful money as required by law. Under such conditions they are a constant menace to the financial stability of the government and private business. Future contingencies may well arise under which those notes would seriously interefere with the proper operation of our currency system. Fortunately those notes circulate freely because the people know that the government is responsible for their redemption.

Deposits Tied Up

"Again, according to recent figures the provinces and municipalities have on deposit with the bank some P.16,765,000. This represents the working balances of these organizations. Together with other deposits they are tied up in long time capital loans and investments. The insular government must hold itself responsible for these as well as other deposits, and must see that local governments do not suffer from inability to secure these funds as needed.

"The government is thus faced with an exceedingly difficult situation. The failure of the bank was due to Americans as well as to Filipinos for the power which lay in the hands of the former was not properly exercised. The United States has twice demonstrated its failure in the field of commercial banking. It is quite natural, therefore, that the policy of the government in Washington should be that the Philippine government should retire from the banking business as rapidly as practicable.

"Force of necessity has required that the bank be kept in business in spite of the fact that it has operated in open violation of law and in competition with private institutions, and contrary to the announced policy of getting the government out of business. The board of control has, however, endeavored to confine the activities of the bank as closely as possible to liquidation. Under date of April 29, 1922, I outlined very clearly to the general manager of the bank the policy of the board of control in this respect. Again under date of February 1, 1923, this policy was reiterated in a letter to the president of the bank impressing upon the board of directors the necessity of bringing the operations of the bank into strict harmony with the policy of getting the government out of business. Copies of both letters follows:

(Continued on page 615).

The China Society of America

A Common-Sense Program for Educating Chinese in America

AMERICANS and Chinese alike have reason to feel optimistic over the new program adopted by the China society of America having for its object the attainment of practical benefits from our general educational policy towards China. For a long time it has been apparent to close observers that the American system of educating young Chinese failed to equip them for usefulness on their return home. The influence for good exerted by these returned students is not underestimated but it is recognized that a university training, valuable as it is, should be supplemented by practical experience after graduation in some of the many great American industrial establishments. A knowledge of American business methods combined with technical practice is essential to the success of the young Chinese college graduate if he is to become a leader in industry and co-operate with American firms for the extension of their trade on his return to China.

Two of America's Greatest Executives Direct the China Society

Hon. W. Cameron Forbes

Former Governor-General of the Philippine Islands, now Honorary President of the China Society of America

Major-General James G. Harbord

Former Chief of Staff of the American Army, now President of the Radio Corporation of America, and the China Society of America

The system of educating Chinese in America where they absorb ideals difficult to live up to or apply in practice on their return home, is open to considerable criticism, as above all other things China needs at this crisis in her national life, the services of men trained to understand their own problems, to think, talk, dress and develop as Chinese citizens. The practice of turning out annually hundreds of college graduates and returning them to China in a half-basked condition, filled with democratic ideals and a theoretical groundwork in popular government, is largely responsible for the political unrest in this country. Such men are misfits in the Chinese scheme of government and utilized only in such positions where their presence serves to delude the foreigner that the old system is changing. The best of them like Alfred Sze, Wellington Koo, C. T. Wang, Wang Chung-huei and W. W. Yen are merely window-dressings for the foreigners to admire, diverting attention from the old style mandarins, the real rulers of the country.

The British and French were quick to see the defects in our system and make plans to use our groundwork as the basis for a course of practical training in their machine shops, foundries and textile mills. The war was hardly over when the French government arranged with the Peking authorities to send a large number of young Chinese to France for a year of "training in civilization," which translated into its proper meaning, meant a year of practical experience in French industrial establishments where the student of civilization would be taught the use of French tools and machinery and then returned to China as trade missionaries. The British accepted the same principle, insisting, however, that the Chinese should be educated and trained in China, at the Hongkong University. In later discussions over the best method of applying the boxer indemnity for educational purposes, the British favored the plan of using the funds for the erection and endowment of a textile school in Shanghai.

It was recognized by our trade competitors that Young China was receiving a liberal education in American colleges in general subjects presenting them with the opportunity to utilize this groundwork to their own advantage along more practical lines and reap the material profits from the American outlay in altruism. The

China society of America has recognized the defects in our system and under the able direction of Professor McElroy has initiated a movement that will enable the young Chinese student to supplement his college work with a course of practical training in our industrial establishment. In pursuance of this program several hundred have been successfully placed in manufacturing plants, banks and business offices throughout the country. In the long run this departure should be productive of excellent results. However, it still has its weak points arising from the absence of large American industrial enterprises or commercial firms in China who can give employment to such men on their return. In the keen competition to win China's confidence and trade by benefits, it is hardly to be expected that British, French or Japanese controlled enterprises will open the door of opportunity to Chinese trained in America and favoring American materials. If Americans hope to reap and material gains from the new departure, they must go further and furnish the capital for the creation of American industries or construction of loan built railways that will provide employment for their proteges, or, hope for the best through their employment in purely native enterprises. Notwithstanding the present dark outlook for the development of native resources through the investment of native capital, the new American plan has much to commend it. It is a step in the right direction.

It is especially gratifying to see that the China society has abandoned its former anti-Japanese attitude and is now pursuing a policy calculated to make for peace and harmony in Asia. It is also a matter of congratulation for Americans interested in the Far East to learn that the society is now directed by men of broad vision and experience in handling Asiatic questions, men who command the full confidence and respect of their countrymen of all political beliefs and parties. With the Hon. W. Cameron Forbes as honorary president and Major-General James G. Harbord as president, the China society enjoys a leadership which few national organizations can hope to equal. The record of W. Cameron Forbes as governor-general of the Philippines typifies all that stands for efficiency and probity in public life and the highest ideals of government. A great administrator, big-hearted philanthropist and a statesman of the highest order with a full understanding of the basic problems of the Orient, the honorary president of the society may be expected to exert his great influence for the peaceful and honorable solution of problems which still exist to unsettle conditions and make for unpleasantness in international relations in this part of the world.

As its president, the society has one of the greatest soldiers and executives our country has produced. General Harbord is also president of the Radio Corporation of America with a lively interest in Far Eastern affairs. In addition, the society counts on its board of directors Mr. Edward Marshall one of the most brilliant names in American journalism. The other directors elected at the last annual meeting of the society are Owen Roberts, former president of the society; M. A. Oudin, vice-president of the International General Electric Co.; Charles Haydon, president, Haydon, Stone & Co.; K. C. Li, president, Wah Chang Trading Co.; R. C. Patterson, jr., vice-president of the Peacock Film Corp.; Edward Marshall, of the Edward Marshall International News Syndicate; Mrs. John Allen Dougherty, of Washington, D. C.; Mrs. Simeon Ford, of New York city; A. J. Drexel Biddle, jr., vice-president of China Enterprises, Inc.; Mrs. Thomas Lamont, of New York city; Dr. Frederick Peterson of New York; with Professor Robert M'elroy of Princeton, as managing director.

Six Men Out of a Job

"The next governor-general of the Philippines will be a Filipino."

ON several occasions during the past six months we have been confidentially informed by those close to the native Filipino political leaders that this was the next step on the road to independence. It is hardly necessary to name the aspirant for gubernatorial honors as recent events leave no doubt as to his identity. In order, however, to prepare the ground for these long deferred hopes, a vacancy in Malacanan palace was quite essential and as there appeared to be no immediate prospect that the present tenant would voluntarily seek other quarters, the Filipino politicos set out to facilitate and quicken his departure. Which gives us the background of the conspiracy to create an issue that would either frighten him away or compel his recall.

The appointment of Leonard Wood to the governor-generalship of the Philippines carried with it the mission of salving the wreck after eight years of sentimental democracy directed by native politicians under the leadership of Manual Quezon. This most capable and shrewd *politico* picked General Wood's predecessor for the job and for eight long years dictated his policies. The governor-general's name was Harrison, but the power behind the throne was Quezon, the hero of the independence movement. Four more years of Wilsonian democracy would have firmly consolidated his rule and by this time, the United States would either have a first-class insurrection on its hands or forced to concede absolute independence to the islands with Su Excelentissimo Senor Don Manual L. Quezon holding down the Big Chair in the Ayuntimiento, extending his legs under the mahogany at Malacanan, and receiving the salute of the Filipino army corps on Wallace field.

The Wood-Forbes mission spoiled these well-laid plans. In recommending that "under no circumstances should the United States permit to be established in the Philippine Islands a situation which would leave the United States in a position of responsibility without authority," General Wood incurred the undying enmity of the independence party. Figuratively speaking, since that time Don Manuel has been silently and assiduously grinding and whetting his trusty bolo against the time he could use it on Wood's official neck. After two years of tom-toming, war dancing and working up to the proper frenzy, the agile Filipino finally saw what he thought was a good opening and slashed out with a blow that would have felled a less skilfull antagonist and added his top-piece to the dessictated trophies adorning the head-hunter's fire-place.

This, in brief, is the story wafted to us by the summer typhoons from the palmy isles of the Southern Seas. Quezon has swung his bolo and challenged the governor-general and Washington to the show down which it is hoped will result in hanging a To Let sign on the palace gates of Malacanan. The entire Filipino cabinet has danced to the sound of the war-drum and resigned their jobs in a body to rally around the big cacique. A cablegram has been dispatched to the president demanding Wood's immediate recall. Wood, however, has accepted the six resignations and is standing pat waiting for the next move. President Coolidge has the option of endorsing the governor-general or of recalling him handing over the government to the Filipinos, pulling up stakes and leaving the islands to their fate, in which case, Don Manuel moves in when Wood moves out. Until moving day comes around, however, the much advertised political crisis in the Philippines resolves itself into a very simple economic problem. Six men are out of a job. That is all.

Foreign Supervision Over China's Railways

A Comparison of Chinese and S.M.R. Statistics which Reveal how China's Railways are being Looted

THE Westminster Bank, the Hongkong and Shanghai Banking Corporation, and the Yokohama Specie Bank, as agents for the Industrial Bank of Japan, have issued in London £4 millions 5 per cent. sterling bonds of the South Manchurian Railway Company at 88 per cent. The bonds are repayable at par in 1948, with an option to the Company to redeem the whole or part after 1933. Both principal and interest are unconditionally guaranteed by the imperial Japanese government. The total share capital of the Company is 380 million yen, of which 120 million—about £12 millions sterling—is held by the Japanese government as compensation for guaranteeing that amount of $4\frac{1}{2}$ and 5 per cent. debentures issued here in 1907, 1908, and 1911, and still outstanding. Of these, the 5 per cent. debentures, which are repayable at par in 1932, stand at 94, thus giving a yield of $5\frac{7}{8}$ per cent., while the present issue will return anything from that amount up to $6\frac{1}{2}$ per cent., according as it is redeemed late or early. In addition to sterling loans there are internal debentures to a total of 195 million yen. After paying the dividends on these debentures, the profits for the last four years average some 39 million yen, or enough to cover the service of the sterling debentures about five times. Further figures show that most of the Company's activities are meeting with increasing success each year, and, in fact, the growth has exceeded expectations, with the result that the present issue had to be made to provide capital for new railway and harbour facilities.

The floating of this loan in London is accepted in Chinese official circles as further evidence of the existence of a "gentleman's agreement" between the members of the consortium to recognize Japan's special position in Manchuria in violation of the Washington treaties. In the opinion of this element the Y.20,000,000 loan to the Oriental Development Company by American group bankers was also the outcome of this secret understanding, overlooking that the consortium pact does not cover existing railways or those lines upon which substantial progress has been made. Under no stretch of the imagination can the South Manchuria Railway or its branches be included within the scope of the consortium agreement, any more than those loan-built lines in China proper, which unless all signs fail, will sooner or later be forced into the money markets for new capital for necessary improvements and extensions.

The collapse of China's railway finance coupled with a cynical disregard for maintenance and the terms of loan agreements have almost destroyed the earning power of the properties and eliminated them as security for the service of their construction loans. The pitiable condition of China's railways has precipitated the movement for the employment of a foreign directed police, auditors and traffic managers to safeguard the bondholders and save something from the wreck. As matters stand, it is hopeless for China to expect foreign financial aid in the reconstruction or extension of her transportation system except under such conditions as will provide adequate guarantees that the interests of the bondholders will be protected, and from the present outlook, new construction is out of the question for many years unless existing railway revenues are, set aside for its financing. The one and only hope for an early resumption of railway construction in China lies in the complete severance of the railway board from the other ministries and the application of an independent budget system that will set aside the revenues of existing lines for financing extensions through foreign loans.

When we recall that British and French investors have furnished practically all the funds for the construction of Chinese railways and have seen their security all but ruined by the application of a policy which admits of no intervention for protecting their interests, we can better understand and sympathize with the movement to bring all the lines under more effective control. There is no good reason why China's railways should not contribute a handsome surplus to the national treasury over and above the sums needed for the service of old loans and new construction. The remarkable results arising from efficient management and protection can be seen in a comparison of the Chinese government railway statistics with the results obtained by the Japanese owned and operated South Manchuria system. Remembering that the population of China proper is placed at several hundred per square mile while that of Manchuria is 35 to 40, the following figures compiled from official reports tell their own story.

In the first table will be found a comparison of the mileage of all Chinese government lines with that of the South Manchuria railway over the period 1915-1920. It will be seen that the Chinese system has a total length of 6,042 kilometres or nearly six times the length of the Manchurian lines of 1,106 km. With this handicap, (Table 2) the South Manchuria Railway enjoys a revenue per kilometer of $77,140 (silver Yuan) against $15,689 for the Chinese system. With one-sixth the mileage the Japanese operated lines benefit in revenues five times the amount collected by China. In Table 3, we find that the Japanese line has 30 locomotives per 100 km. with a tractive power (Table 4) of 436 metric tons against 13 locos with a tractive power of 131 metric tons for the Chinese lines. The Japanese line has 30 passenger cars (Table 5) per 100 km. against 23 for the Chinese and 508 freight cars (Table 6) with a capacity of 13,673 metric tons (Table 7) against 203 with a capacity of 5,028 metric tons for the Chinese lines. The average number of paying passengers transported per kilometre by the S. M. R. is 7,344 (Table 8) bringing in a revenue of $12,341 against 5,241 passengers with a revenue of $5,397 for the Chinese system. The average metric tonnage carried by the S. M. R. per km. is 8,329 against 3,693 for the Chinese lines, or an average *total* per km. of 3,017,000 metric tons against 758,000 metric tons for the Chinese system. The average freight receipts per km. for the S. M. R. are $57,476 or about seven times greater than the $8,454 collected by the Chinese lines.

These figures are eloquent and explain why the South Manchuria Railway can raise a loan participated in by the most important British bank in China without difficulty, while the same group of bankers demand exceptional guarantees from China. At the same time, the comparison clearly conveys the reason why other powers decline to intervene or take sides in the never ending political squabbles started by China to drive Japan out of Kwantung and Manchuria. The restoration of the S.M.R. terminus and deep water port to Chinese sovereignty would simply invite the same catastrophe which has befallen all other important foreign investments when placed under Chinese direction. One year of Chinese misgovernment in Kwantung and the railway zone, would wipe out one of the most important civilizing influences in the whole of Asia.

Bearing in mind the great difference in the density of population and industrial development between China proper and the territory served by the S.M.R., it would seem that with efficient honest direction the 6,000 kilometres of Chinese operated state railways could be brought to earn revenues of $462,840,000 per year, the same as the Japanese managed line, instead of the present $94,000,000. The difference of $368,000,000 would pay for all new railway construction, finance the government and create industries without having to call on foreigners for financial assistance. The S.M.R. figures at the best are only an indication of what the future holds out, for as the branches under construction are completed opening up new territory to agriculture and colonization, as northern Manchuria contributes her quota of wheat and flour for export, as the Fushun mines reach their full output and other resources are developed, the revenues of the S.M.R. may be expected to double. Every energy of its management is directed towards this end, and each year it becomes necessary to provide new capital in the form of loans to hasten development. China has a wonderful example in her own territory of what she can expect when her railways, no longer the playthings of politicians and *tuchuns*, are brought under efficient management through an independent railway commission working in harmony with friendly foreign assistance.

COMPARATIVE STATISTICS OF THE CHINESE GOVERNMENT AND SOUTH MANCHURIA RAILWAYS.

	1915	*1916*	*1917*	*1918*	*1919*	*1920*
Length of Line I. in km. including Branches.						
Peking-Hankow Railway ...	1,316	1.313	1.313	1.313	1.313	1.321
Peking-Mukden	965	965	975	975	975	975
Tientsin-Pukow	1,107	1.107	1.107	1.107	1.107	1.107
Shanghai-Nanking	327	327	327	327	327	327
Shanghai-Hangchow-Ningpo..	270	286	286	286	286	286
Peking-Suiyuan	429	467	467	495	495	499
Cheng-Tai	243	243	243	243	243	243
Chinghua-Taoku	152	152	152	152	152	152
Pienlo	185	185	185	185	185	185
Kirin-Changchun	130	130	130	130	125	125
Pinghsiang-Chuchow ...	97	97	97	91	91	91
Canton-Kowloon	143	143	143	143	143	143
Canton-Sanshui	49	49	49	49	49	49
Changchow-Amoy	32	28	29	28	28	28
Canton-Hankow	—	—	—	—	423	423
Ssupingkai-Chengchiatun ...	—	—	—	—	88	88
Total	5,445	5,492	5,503	5,524	6,030	6,042
South Manchuria	1,112	1,112	1,112	1,112	1,109	1,106
Gross Receipts per Kilometre Yuen (silver dollar).						
Peking-Hankow Railway ...	13,099	15,653	14,353	18,291	20,343	19,905
Peking-Mukden	15,985	15,745	18,053	22,058	21,211	24,069
Tientsin-Pukow	7,729	9,318	9,589	11,443	12,836	14,701
Shanghai-Nanking	10,529	11,737	12,991	15,003	17,572	21,058
Shanghai-Hangchow-Ningpo..	7,674	6,556	7,965	8,493	9,266	10,636
Peking-Suiyan	8,450	8,407	8,060	9,131	10,083	11,729
Cheng-Tai	8,823	9,074	10,494	13,395	14,111	16,284
Chinghua-Taoku	4,164	5,493	6,158	6,296	6,480	8,007
Pienlo	6,281	7,000	7,503	7,016	9,265	14,141
Kirin-Changchun	7,031	7,208	8,754	13,731	15,336	20,480
Pinghsiang-Chuchow ...	7,113	7,670	6,340	6,121	7,703	6,571
Canton-Kowloon	5,713	5,643	6,594	6,406	6,923	7,280
Canton-Sanshui	17,388	19,653	—	—	—	—
Changchow-Amoy	594	1,679	1,828	1,679	1,000	500
Canton-Hankow	—	—	—	—	468	378
Ssupingkai-Chengchiatun ...	—	—	—	—	3,580	9,250
Average	10,577	11,568	11,807	14,276	14,140	15,689
South Manchuria Railway ...	21,487	25,013	30,987	40,461	60,470	77,140
Number of Locomotives per 100 km.						
Peking-Hankow Railway ...	10	10	11	11	11	12
Peking-Mukden	15	16	16	16	17	18
Tientsin-Pukow	9	8	8	8	9	11
Shanghai-Nanking	11	11	11	11	11	13
Shanghai-Hangchow-Ningpo..	13	13	13	13	13	13
Peking-Suiyuan	14	13	14	14	14	16
Cheng-Tai	23	23	23	23	23	23
Chinghua-Taoku	7	7	7	7	8	8

	1915	1916	1917	1918	1919	1920
Pienlo	8	8	8	8	8	8
Kirin-Chengchun	10	10	10	10	14	14
Pinghsiang-Chuchow	12	12	12	13	13	13
Canton-Kowloon	10	10	10	10	10	10
Canton-Sanshui	20	8	—	—	—	—
Changchow-Amoy	6	8	7	7	7	7
Canton-Hankow	—	—	—	—	5	8
Ssupingkai-Chengchiatun	—	—	—	—	6	6
Average	12	12	12	12	12	13
South Manchuria Railway	24	24	24	26	30	30

Traction Power of a Locomotive per 100 km. (metric ton).

	1915	1916	1917	1918	1919	1920
Peking-Hankow Railway	86	86	99	98	98	117
Peking-Mukden	126	136	137	139	161	174
Tientsin-Pukow	87	87	87	87	101	144
Shanghai-Nanking	94	94	94	94	94	110
Shanghai-Hangchow-Ningpo	122	114	114	114	114	114
Peking-Suiyuan	179	169	189	191	191	206
Cheng-Tai	123	123	123	123	123	123
Chinghua-Taoku	57	45	57	57	71	71
Pienlo	64	64	64	64	56	56
Kirin-Changchun	86	86	61	83	128	128
Pinghsiang-Chuchow	96	96	96	101	101	101
Canton-Kowloon	82	82	81	81	81	81
Canton-Sanshui	116	117	—	—	—	—
Changchow-Amoy	34	38	38	38	38	21
Canton-Hankow	—	—	—	—	63	97
Ssupingkai-Chengchiatun	—	—	—	—	13	68
Average	103	104	109	110	112	131
South Manchuria Railway	302	205	305	338	411	435

Number of Passenger-Cars per 100 km.

	1915	1916	1917	1918	1919	1920
Peking-Hankow Railway	14	18	14	17	20	21
Peking-Mukden	35	35	36	30	29	31
Tientsin-Pukow	20	20	20	18	18	18
Shanghai-Nanking	31	31	31	31	31	31
Shanghai-Hangchow-Ningpo	42	40	43	44	44	48
Peking-Suiyuan	19	17	17	19	19	20
Cheng-Tai	20	21	21	21	21	21
Chinghua-Taoku	18	15	14	12	12	12
Pienlo	19	19	21	26	26	31
Kirin-Changchun	20	20	19	13	14	14
Pinghsiang-Chuchow	16	17	17	18	18	24
Canton-Kowloon	31	31	29	29	29	29
Canton-Sanshui	85	86	—	—	—	—
Changchow-Amoy	18	21	25	25	25	25
ffanson-Hankow	—	—	—	—	12	11
Ssupingkai-Chengchiatun	—	—	—	—	13	14
Average	23	24	24	23	22	23
South Manchuria Railway	19	20	21	23	27	30

Number of Freight—Cars per 100 km.

	1915	1916	1917	1918	1919	1920
Peking-Hankow Railway	204	200	201	203	201	251
Peking-Mukden	244	344	345	350	345	386
Tientsin-Pukow	119	119	123	126	117	117
Shanghai-Nanking	134	133	133	134	134	134
Shanghai-Hangchow-Ningpo	195	180	177	177	176	168
Peking-Suiyuan	200	185	186	172	172	177
Cheng-Tai	258	258	258	258	258	258
Chinghua-Taoku	105	108	111	123	134	215
Pienlo	119	119	112	108	111	105
Kirin-Changchun	178	178	176	182	182	182
Pinghsiang-Chuchow	190	190	190	208	208	198
Canton-Kowloon	44	45	47	47	47	47
Canton-Sanshui	41	41	—	—	—	—
Changchow-Amoy	31	36	32	32	32	41
Canton-Hankow	—	—	—	—	85	85
Ssupingkai-Chengchiatun	—	—	—	—	26	32
Average	196	193	194	197	189	203
South Manchuria Railway	286	286	308	377	433	508

Capacity of Freight-Car metric ton.

	1915	1916	1917	1918	1919	1920
Peking-Hankow Railway	4,254	4,255	4,269	4,270	4,259	6,377
Peking-Mukden	7,482	7,365	7,423	7,389	8,876	9,319
Tientsin-Pukow	2,841	2,853	2,988	3,016	2,850	2,845
Shanghai-Nanking	3,400	3,328	3,306	3,320	3,330	3,326
Shanghai-Hangchow-Ningpo	5,653	5,133	5,052	5,040	4,949	4,720
Peking-Suiyuan	5,760	5,203	5,228	4,840	4,837	4,869
Cheng-Tai	5,190	5,272	5,272	5,272	5,272	5,276
Chinghua-Taoku	2,983	3,028	3,113	3,507	3,802	6,898
Pienlo	2,389	2,389	1,697	2,163	2,227	2,108
Kirin-Changchun	3,832	3,772	3,699	3,699	3,799	3,799
Pinghsiang-Chuchow	3,822	3,762	3,762	4,037	4,037	3,961
Canton-Kowloon	1,017	1,042	1,085	1,085	1,085	938
Canton-Sanshi	1,122	1,103	—	—	—	—
Changchow-Amoy	631	714	642	642	642	642
Canton-Hankow	—	—	—	—	2,053	2,048
Ssupingkai-Chengchiatun	—	—	—	—	712	867
Average	4,468	4,389	4,399	4,440	4,434	5,028
South Manchuria Railway	7,806	7,839	8,351	10,175	11,639	13,673

Average Number of Persons Transported per km.

	1915	1916	1917	1918	1919	1920
Peking-Hankow Railway	2,075	2,374	2,574	2,751	3,072	3,036
Peking-Mukden	3,557	3,625	3,896	3,667	3,603	5,204
Tientsin-Pukow	2,148	2,481	1,974	2,211	2,344	2,900
Shanghai-Nanking	16,632	17,494	17,687	19,563	21,778	25,054
Shanghai-Hangchow-Ningpo	15,511	14,380	16,316	17,730	18,987	20,054
Peking-Suiyuan	1,634	1,747	1,989	1,748	2,350	2,198
Cheng-Tai	1,017	977	1,047	1,126	1,297	1,487
Chinghua-Taoku	1,429	761	1 407	1 562	1 800	2,068
Pienlo	2,814	3,046	3,020	3,204	4,101	5,282
Kirin-Changchun	2,058	2,071	2,914	3,003	2,520	3,822
Pinghsiang-Chuchow	3,601	3,913	3,357	1,422	3,671	3,776
Canton-Kowloon	15,397	14,405	14,321	12,305	12,973	13,554
Canton-Sanchui	85,207	133,157	—	—	—	—
Changchow-Amoy	—	7,382	7,226	4,234	—	720
Canton-Hankow	—	—	—	—	1,752	—
Ssupingkai-Chengchiatun	—	—	—	—	896	2,162
Average	4,811	5,531	4,663	2,825	4,674	5,241
South Manchuria Railway	3,335	3,966	5,256	6,737	8,362	7,344

Average Passenger Receipts per km. Tickets Receipts only.
Yuen (silver dollar)

	1915	1916	1917	1918	1919	1920
Peking-Hankow Railway	2,958	3,334	?,369	4,036	4,903	5,585
Peking-Mukden	5,629	6,128	8,721	7,833	7,600	10,375
Tientsin-Pukow	2,989	3,488	3,766	4,498	4,977	5,728
Shanghai-Nanking	7,166	7,747	8,185	8,700	9,911	11,338
Shanghai-Hangchow-Ningpo	4,702	4,386	5,102	5,508	5,900	6,752
Peking-Suiyuan	1,836	1,820	1,852	1,748	2,341	2,494
Cheng-Tai	1,782	1,831	1,835	2,097	2,323	2,635
Chinghua-Taoku	703	804	845	891	1,124	1,223
Pienlo	2,943	3,074	2,924	3,009	3,921	4,723
Kirin-Changchun	2,574	2,638	2,911	4,141	4,468	5,388
Pinghsiang-Chuchow	1,146	1,187	684	528	1,302	1,316
Canton-Kowloon	4,754	4,542	3,735	5,168	5,809	6,202
Canton-Sanshui	16,530	18,184	—	—	—	—
Changchow-Amoy	—	1,483	1,700	803	—	77
Canton-Hankow	—	—	—	—	919	1,227
Ssupingkai-Chengchiatun	—	—	—	—	1,112	2,706
Average	3,705	3,998	4,209	4,703	4,782	5,397
South Manchuria Railway	4,085	5,034	6,813	9,788	11,879	12,341

Average Metric Tonnage Transported per km. metric ton.

	1915	1916	1917	1918	1919	1920
Peking-Hankow Railway	2,705	2,669	2,746	2,992	3,627	3,509
Peking-Mukden	5,629	5,164	5,545	6,169	6,805	7,207
Tientsin-Pukow	1,826	1,940	1,792	2,217	2,404	2,615
Shanghai-Nanking	2,568	2,740	2,973	3,458	4,134	4,275
Shanghai-Hangchow-Ningpo	1,733	1,276	1,621	1,623	1,728	2,043
Peking-Suiyuan	2,465	3,901	2,363	2,625	2,785	2,995
Cheng-Tai	2,560	3,290	3,491	4,656	4,771	4,983
Chinghua-Taoku	3,726	5,477	6,439	6,133	6,116	5,906
Pienlo	1,493	2,119	2,537	2,127	2,658	2,588
Kirin-Changchun	2,979	2,983	2,408	3,513	3,905	5,196
Pinghsiang-Chuchow	6,499	6,828	5,618	4,183	6,405	4,838
Canton-Kowloon	438	547	688	663	564	555
Canton-Sanshui	179	420	—	—	—	—
Changchow-Amoy	—	69	90	197	76	35
Canton-Hankow	—	—	—	—	2,740	2,881
Ssupingkai-Chengchiatun	—	—	—	—	1,218	2,786
Average	2,941	3,033	3,069	3,353	3,547	3,693
South Manchuria Railway	4,781	5,083	5,933	6,799	8,260	8,329

Average Total Metric Tonnage per km. 1000 metric tons.

	1915	1916	1917	1918	1919	1920
Peking-Hankow Railway	515	634	576	832	943	1,049
Peking-Mukden	744	678	825	933	1,031	1,075
Tientsin-Pukow	332	489	542	650	703	800
Shanghai-Nanking	523	599	612	773	930	930
Shanghai-Hangchow-Ningpo	154	120	169	182	204	253
Peking-Suiyuan	236	250	225	270	319	421
Cheng-Tai	101	264	289	369	401	467
Chinghua-Taoku	289	408	437	440	441	440
Pienlo	117	152	162	155	172	195
Kirin-Changchun	166	178	207	343	341	346
Pinghsiang-Chuchow	607	638	527	324	553	422
Canton-Kowloon	23	31	41	45	35	36
Canton-Sanshui	5	4	—	—	—	—
Changchow-Amoy	—	1	2	2	1	15
Canton-Hankow	—	—	—	—	128	144
Ssupingkai-Chengchiatun	—	—	—	—	85	183
Average	416	477	502	616	641	758
South Manchuria Railway	1,508	1,709	1,982	2,239	2,721	3,017

Average Freight Traffic Receipts per km. Yuen (silver dollar)

	1915	1916	1917	1918	1919	1920
Peking-Hankow Railway	9,291	10,663	9,783	12,516	13,863	13,437
Peking-Mukden	9,124	7,948	9,539	11,760	10,605	11,945
Tientsin-Pukow	3,525	4,509	4,518	5,374	5,898	7,141
Shanghai-Nanking	2,501	2,962	3,609	4,627	5,510	5,564
Shanghai-Hangchow-Ningpo	1,987	1,553	1,927	2,365	2,564	2,965
Peking-Suiyuan	5,619	5,664	5,338	6,289	6,611	8,052
Cheng-Tai	6,414	6,189	7,519	9,775	10,162	11,935
Chinghua-Taoku	3,343	4,526	5,131	5,024	4,949	4,964
Pienlo	3,048	3,730	3,513	2,949	4,255	4,283
Kirin-Changchun	3,961	3,926	4,854	8,573	9,098	10,171
Pinghsiang-Chuchow	5,772	6,293	5,223	4,277	6,093	4,838
Canton-Kowloon	518	752	864	913	350	913
Canton-Sanshui	338	834	—	—	—	—
Changchow-Amoy	—	44	49	55	39	46
Canton-Hankow	—	—	—	—	1,448	1,453
Ssupingkai Chengchiatun	—	—	—	—	2,062	4,606
Average	6,003	6,331	6,446	7,961	7,839	8,454
South Manchuria Railway	15,522	17,880	21,391	27,318	41,754	57,746

Tomosaburo Kato

It is barely two years since Takashi Hara, the great commoner and leader of liberal Japan was stricken down by the dagger of an assassin at a time when the nation was passing through the most eventful crisis of its long history. Many there were, even in Japan, who believed that he was the one statesman who weilded the power to dominate the situation and pilot the government through the perilous seas of international intrigue, distrust and hostility. The forward movement, however, had carried Japan so far towards the goal of liberal ideals, that his death could not alter the course and when he died the helm was taken over by Viscount Takahashi only to be surrendered in a few months to the capable hands of Admiral Viscount Kato who navigated the ship of state to a safe anchorage in the haven of world sympathy, confidence and good-will.

Death has again deprived Japan of her guiding spirit. Premier Kato has passed on. Japan has lost a grand and noble son, a warrior and statesman incarnating the traditional chivalry and those sterling qualities of the Samurai which have carried the nation to its present proud place amongst the great powers of the world. Japan's loss is a loss to the world. Few indeed are the great men of the day who have attained to such a high place in the esteem of other nations as the gallant sailor-son of Nippon who gladly accepted the scrapping of a navy he had labored years to create in order that peace might come to his people and would confidence in their government restored.

The Late Premier of Japan.
Fleet Admiral Viscount Tomosaburo Kato.

Amongst the great fleet captains of other nations whose names go thundering down the pages of history are few who have equalled the exploit of this silent, grim and effective tactician, who as Togo's chief of staff, directed and won the most decisive naval battle of modern times. Few indeed are the great naval commanders who have lived to see their cherished plans developed to a point where other powerful nations have been influenced into calling a halt in the race for sea supremacy. The indomitable will which carried through this program in order that the empire would retain its hard won place in a hostile world, typifies the spirit which animates Japan in her determination to defend herself at all costs against any menace to her national existence.

At the Washington conference, the brilliant statesmen and seasoned diplomats of the West were brought face to face perhaps for the first time in their long careers, with the real Japan. Admiral Baron Kato, the warrior-statesmen, come as a revelation which dispelled all previous conceptions. His candor, straightforwardness and sincere desire to work in friendly accord with the powers of the west won for him a fame which outshines the honors accorded to other delegates. Kato was the outstanding figure of the conference. His face, it was said, looked a little like the map of his country, inscrutable, cold and hard. "It would be murder to sit in a poker game with him" said a brilliant American correspondent. These careless remarks, however to the point, ignored the past history of the man who stood silently on the bridge of the *Mikasa* awaiting with folded arms the fateful moment to give the command which would decide his country's fate for all time. He stood in the same position at Washington facing a hostile conference, cool, calm and collected, speaking sparingly and to the point when speech became necessary, reserving until the proper time the final word which once more would decide the fate of Japan.

Kato sat in a poker game in which the future of nations was at stake. Others, with immense reserves of wealth could afford to smile, crack jokes and take liberties with their play. Japan, however, could take no chances, so Kato played his cards with a face which betrayed no sign of his emotions and only when satisfied that the game was honest, a fair give and take on all sides, did the cold, set, poker face relax revealing to the onlookers a countenance which truly reflected the dauntless spirit which shines through the soul map of Japan.

Kato is gone but his work will go forward. His successor on the bridge deck of Nippon will steer the same course confidant that the route charted by the gallant admiral will maintain the position of the nation abreast the other liberal powers in the vanguard of civilization.

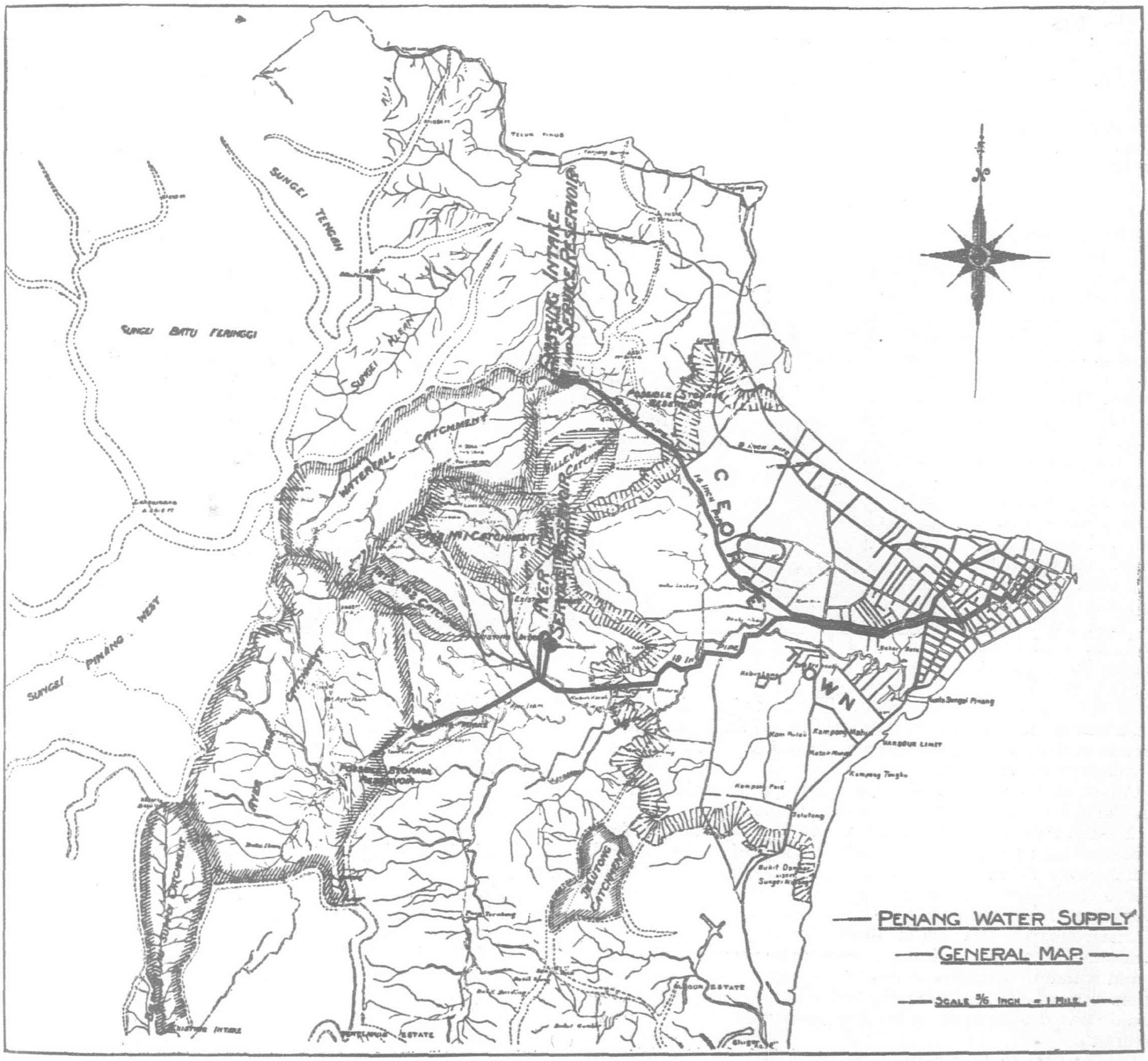
Notes on the Penang Water Supply

1

Paper Read Before the Engineering Association of Malaya

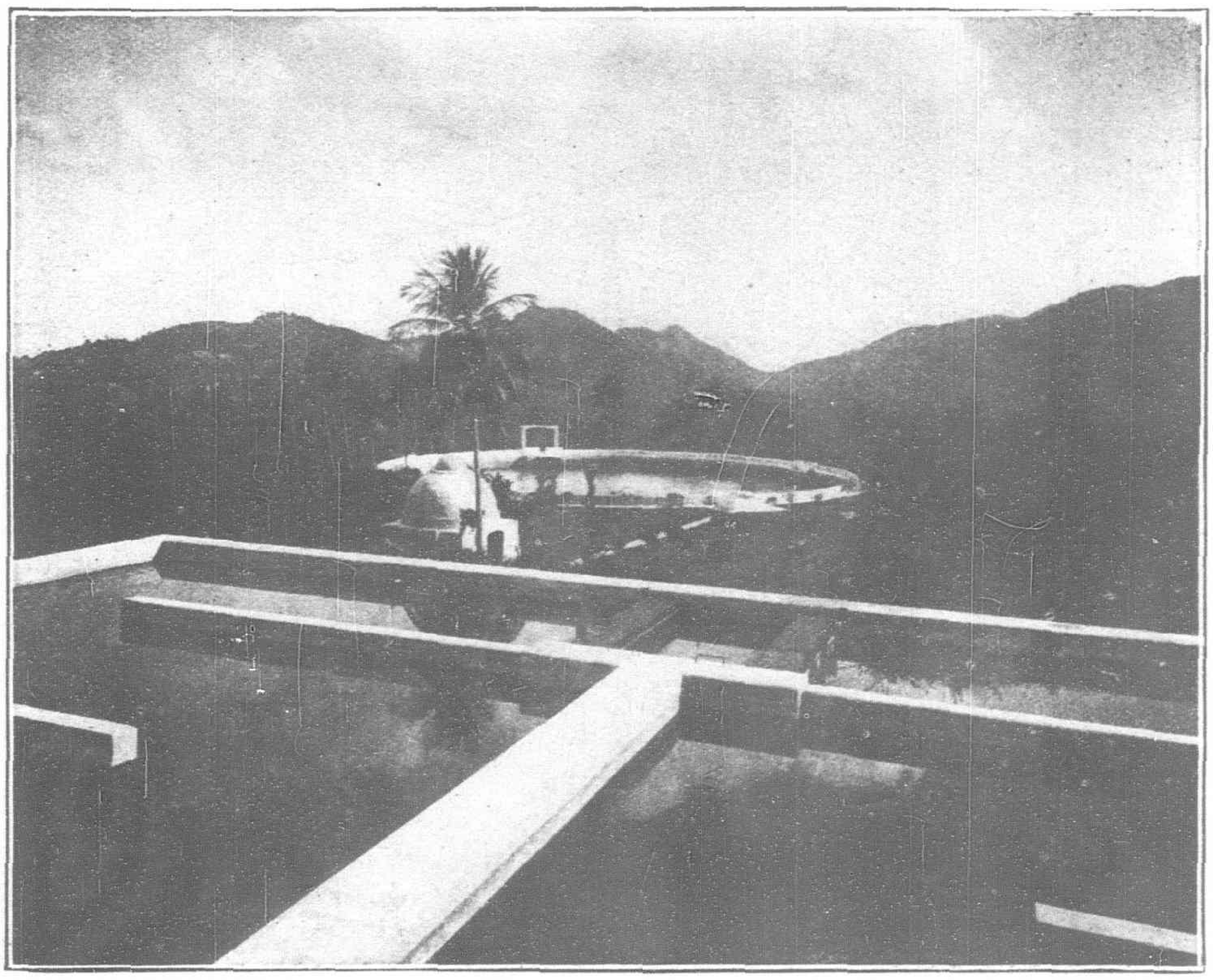
By J. D. Fettes, Assoc. M. Inst. C.E.

THE Ayer Itam service reservoir and its dependent works may be said to be the latest addition to the water supply works of the municipality of George town. Before describing the reservoir it will be interesting perhaps to give shortly some of the history of the water supply prior to the construction of the reservoir (so far as it has been found possible to trace it).



It was in 1803 that Macalister, a captain of artillery, who had lived ten years in Penang, put out a suggestion that a pipe be laid from the waterfall stream to a suggested jetty near the point at Fort Cornwallis for the supply of his majesty's ships. In 1804 the town drew its water supply wholly from wells, and boats were in the habit of going up the Sungei Pinang on the flood tide, filling their water casks from the river at half-ebb, then waiting for the flood tide or its succeeding ebb-tide to get back with water to their ships. "As the men employed in the water boats are very careless, frequent complaints are made of the quality of the water, owing to the casks being filled too soon. To remedy these serious inconveniences, to expedite the departure of ships (particularly men-of-war, who are often pressed for time) and to add, in some degree, to the revenue by taking the watering of the ships entirely into the hands of government, it is proposed to bring one of the small streams down to town either by pipes, or an aqueduct, to form a large reservoir near the present hospital, and from thence convey the water by pipes to a pier head where the boats may come and have their casks filled without trouble or delay; the town could also be furnished with water, if required, by pipes from the reservoir." In 1827 "good water, the source of which is a waterfall from one of the hills, is conveyed in an aqueduct of clay to the English town, and it goes through our grounds." Then we read that in 1830 "An aqueduct extending for several miles conducts water from one of the hills to the harbor, where ships' boats are readily and expeditiously supplied. This, however, has got into disrepair and being uncovered is frequently made the receptacle of every kind of filth, so that the water, by the time it reaches the town, it not always of the purest description. A new and more commodious one, therefore in which water is conveyed by iron pipes underground, is now in progress and is nearly completed. By this not only the shipping, but the town and various public establishments will be supplied with this indispensable article of life in a state of great purity."

The date of the construction of the open aqueduct referred to in para. 2 has not been traced but it is probable that it commenced at an intake on the waterfall stream in grounds that are now known as hill rise (from the name of the house that not long ago stood there about 100 yards to the eastward of the botanical gardens gate) and which water course seems to have followed the right-of-way or reserve road on the north side of the river more or less parallel to the river as far as the Chetty temple where it turned north and ran roughly parallel to Gottlieb-road, then down the north side of Burmah-road and eventually found an outlet at Prangin, but supplied the town probably by way of Hutton lane or Argyle-road. The iron pipe referred to in para. 2 was apparently a 6-in. pipe which was laid from a tank or reservoir in Burmah-road at College Lane just beyond what is now the village of Pulau Tikus.



The Ayer Itam Service Reservoir, Penang

About 1856 or 1857 a 9-in. fire clay pipe was laid from the same Pulau Tikus reservoir to supplement the supply.

Then in 1867 we know that a 9-in. cast iron pipe was laid from the present high level waterfall intake by way of Waterfall-road, Burmah-road, Pulau Tikus, Hutton lane, Argyle-road, Chulia-street to Beach-street, the old 6-in. pipe from Pulau Tikus reservoir or tank being lifted and partly re-laid in Beach-street (and possibly in Carnarvon-street and part of Northam-road). The 6-in. pipe in Beach-street, now, it is believed to be over 90 years old, is still in use and standing pressures of 80-lbs. per square inch. No information is available regarding the old 9-in. fire clay pipe which probably was also taken up, it being useless for the higher waterfall pressures.

During 1877 to 1878 a 16-in. cast iron main was substituted for the 9-in. cast iron main from the waterfall high level intake along Waterfall-road as far as the Chetty temple where it was reduced to 14-in. and continued by way of Western-road and Datok Kramat-road to Magazine corner. As the 9-in. main between the waterfall and the Chetty temple was to be lifted, a connection was made at the Chetty temple between the older 9-in. main and the 16-in. main, so that the 16-in. main supplied then, as it is doing to-day, the 14-in. main down Western-road and the 9-in. main down Burmah-road.

It was in 1878 that the government considered the proposal to establish botanical gardens in the waterfall valley.

In 1884 the supply was extended by tapping the two Tat's streams, but at a lower level than the intakes of to-day, by an intake apparently on No. 2 Tat's with an open channel from No. 1 Tat's to this intake, which was situated close to what is now to be the lower station of the hill railway, and the elevation of which was only 74-ft. above sea level. It is probable that this intake was originally the old Amie's mill dam, of which a picture is to be found in the library. From the intake a 12-in. pipe was laid by way of Ayer Itam-road and Datok Kramat-road to town.

In 1890 the small supply in the Batu Lanchang hills was opened for the supply of the village of Jelutong.

In 1891 further additions were commenced by the construction of the waterfall service reservoir and the tapping of the main Ayer Itam stream at the old intake of a defunct electrical power company. From here an 18-in. main was laid along the Ayer Itam-road to about Kampong Bharu where it connected up with the 12-in. pipe already laid to town from Tat's, part of which 12-in. pipe was lifted. Both the waterfall reservoir and the 18-in. Ayer Itam main, as far as Kampong Bharu, were finished in 1892 and there can be no doubt that the supply from the Tat's sources tapped in 1884 automatically stopped, the Tat's intake being at too low level to be of any further service. Owing to defects the waterfall reservoir was not brought into use until 1894.

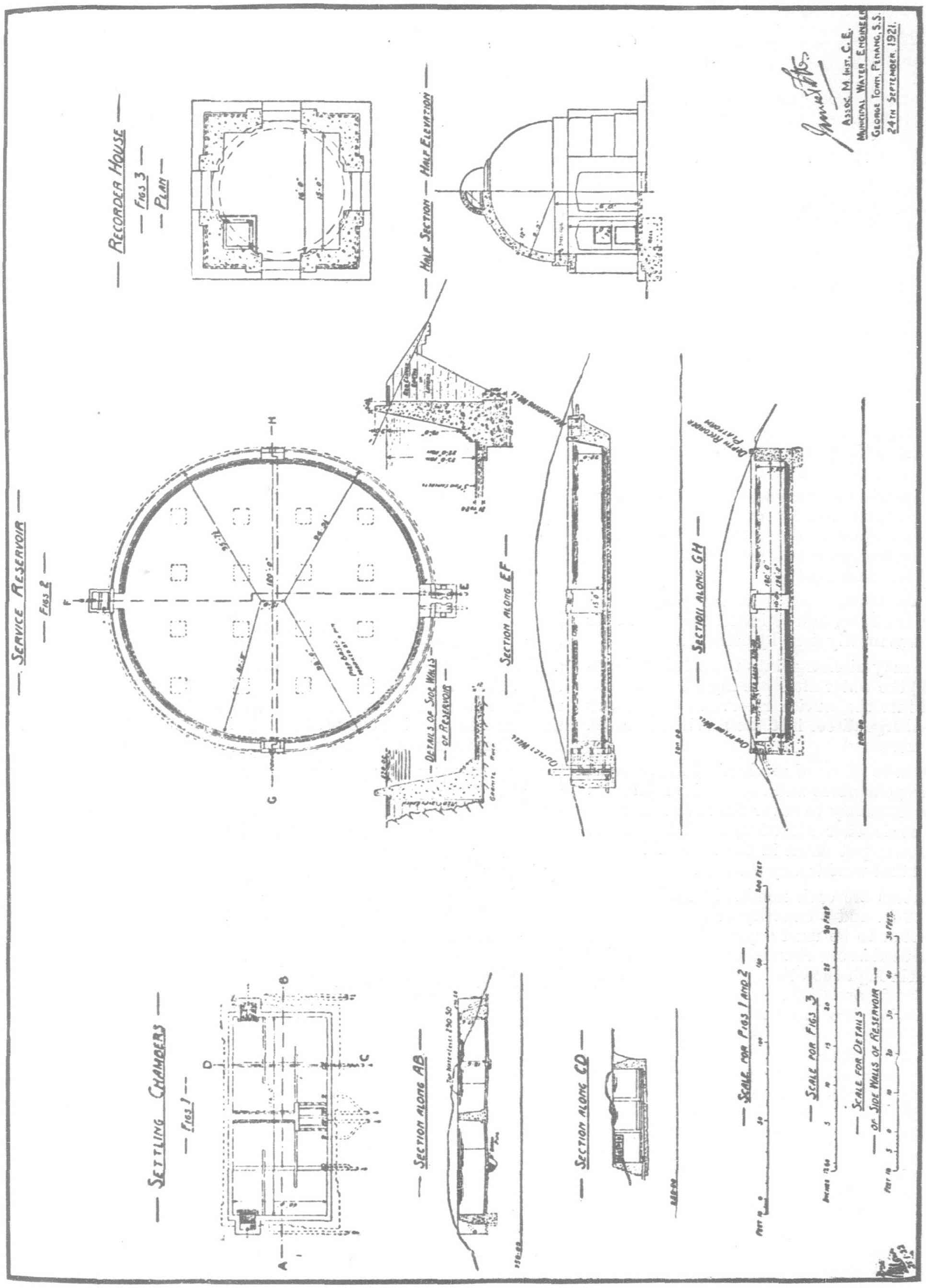
In 1894 we are told there was a drought and the supply was temporarily increased by leading the stream from Moniot's-road into the Ayer Itam intake. This probably refers to part of the Ayer Itam side stream.

In 1895 the 18-in. Ayer Itam main was extended to Green lane and the 12-in. pipes released thereby were re-used to bring in water from Tat's No. 1 but at a much higher level than was the case in 1884.

In 1896 the 18-in. Ayer Itam main was extended to York-road, in 1897 to Dunlop-road and in 1900 to Magazine corner, the 12-in. pipe laid in 1884 being lifted in sections as the 18-in. main was laid down.

In 1901 there was a drought and Tat's No. 2 stream was again tapped but at the higher level. It was also found necessary to pump water by fire engine into the 18-in. main from the river where it crossed the Ayer Itam-road just beyond Scotland-road. It is stated that the water available amounted to 3,676,000 gallons per day to meet a demand of 9,000,000 gallons. It was in this year that the municipal health officer referred to the possibility of dispensing with the supply from Tat's intakes and the diversion of drainage from the inhabited portion of the waterfall gathering ground.

The water supply position was so bad about this time that in 1903 it was recommended to the commissioners that "if supply by meter be not adopted construct large impounding reservoirs in the waterfall valley and at Paya Terubong, only one such to be



PENANG WATER SUPPLY

Ayer Itam Service Reservoir Works

constructed in the near future. . . . . .The remaining site to be utilized when the increased supply calls for it."

In 1909 the position was still very bad and the construction of the waterfall reservoir was again recommended, as was also the Ayer Itam service reservoir.

In 1909 the number of metered services was 1,568 and the number of unmetered services was 5,857, the average daily consumption being 7,297,000 gallons. In 1917 the metered services amounted to 7,067 and the unmetered services amounted to 891, the average consumption being 5,299,000 gallons per day. In 1918, which was a very dry year, the average daily consumption was 5,145,000 gallons but this was in part due to a scarcity of water and the town being on intermittent supply for a time. The town, however, continues to grow and there is now for the first six months in 1921 an average consumption of about 5,595,000 gallons per day, there being 8,582 metered services and 28 unmetered services, the latter being municipal supplies. The charges for water consumed vary from 5 cents per 1,000 gallons when the consumption is less than 12,000 gallons per month to 40 cents per 1,000 gallons for 50,000 gallons and over per month. There are other rates for special supplies such as shipping, etc. The population according to this year's census (1921) is approximately 123,000 persons living in 15,189 houses. The number of houses, etc., which are connected with the water supply amounted at 30th June, 1921 to 10,883. There are still many wells especially in the poor country districts which will be closed as the water supply is extended.

The Ayer Itam service reservoir works were constructed during the period 1911 to 1915 by administration.

In 1918 there was a severe drought and an emergency supply was drawn from the Villevue area (being part of the lower waterfall area).

There are no impounding reservoirs and the water supply system to-day is as follows :—

		gall. per day
Waterfall catchment of 1,200 acres, driest flow	..	1,600,000
Additional, due to storage in service reservoir	..	125,000
Ayer Itam catchment of 2,050 acres, driest flow	..	2,400,000
Additional, due to storage in service reservoir	..	125,000

	gall. per day
Jelutong catchment of 220 acres, driest flow ..	10,000
Villevue (emergency) catchment of 200 acres, driest flow equals say	50,000
Tat's No. 1 catchment of 440 acres, driest flow ..	350,000
Tat's No. 2 catchment of 187 acres, driest flow ..	140,000
Total	4,800,000

The two Tat's areas have become much polluted owing to diversion of drainage, construction of hill railway and cultivation and are not now used. Deducting these areas there remain some 4,310,000 gallons per day which are available during severe drought to meet a present demand of 5,595,000 gallons as an average as stated under para. 17 and probably 5,800,000 gallons as a minimum on a hot day.

As has been stated above, the Ayer Itam service reservoir works were built by administration during the years 1911 to 1915. As the site of these works was nearly a half-mile from the line of the Ayer Itam main in the Ayer Itam-road it was necessary to lay an 18-in. supply pipe from that main to the new works and an 18-in. delivery pipe back to the main in such a way that the return pipe should join the main above the point where a Venturi meter had been fixed in 1905.

A cement concrete bridge with floor of steel girder frame-work encased in concrete, costing $3,620 and let out to contract, was constructed across the Tat's stream to carry the Approach-road and the two lines of 18-in. cast iron pipes laid between the reservoir and the older main in the Ayer Itam-road.

The Approach roadway 10-ft. wide and tar-sprayed has gradients of 1 over 9.80 for the lower half of its length and 1 over 8.50 for the upper half and was mostly done by contract.

The 18-in. supply main may discharge into the settling chambers (top water level 290.50) the water after passing through these chambers being discharged into the service reservoirs (top water level 270.00), or it may discharge direct into the service reservoir. In either case the water is measured.

The works were designed to allow of mechanical filters being installed between the settling chambers and the service reservoir; and lest it should be found necessary to cover the reservoir when used as a clear water reservoir after filtration, cement concrete foundations, 10-ft. square, were put down in the floor of the reservoir to support the pillars that would carry the roof.

The two settling chambers are each nominally 60-ft. square with an average depth of 18-ft. and a capacity of about 700,000 gallons. They are constructed to be used separately but except when being cleaned they are used as one chamber, the water passing first through one and then through the other. The inlet wells to these chambers are 10-ft. by 4-ft. and 6½-ft. deep to overflow level, the water rising and overflowing into the main chamber. When the main chamber is empty, the incoming water overflows from the inlet well and runs down an incline of 4½ over 1 with curved bottom to the floor of the main chamber without shock. The floor of the main chamber slopes 1 over 30 to central sludge channel 2-ft. 6-in. in width and with depth varying from one foot at its upper end to two feet at the scour end. Training walls are provided so that the water in passing through the chambers will move with slow velocity along the greatest length of channel. The water is screened half way along its passage by two screens and again before leaving the second chamber. The inlet and outlet wells are cleaned every week and the main chambers every three months. All concrete work is of 1—2—3 cement concrete, laid in courses 3-ft. high bonded and grooved for water-tightness rendered on the exposed face with 1 to 1 cement mortar except the training walls which are of cement concrete bricks laid in cement mortar and rendered. The upper face of the floor is of fine concrete about 3-in. thick, rammed, cement dusted and floated to a smooth surface and of a mixture which works out to 1 of cement to 1.636 of granite crush. The outer walls are 3-ft. wide at the top and are stepped on the back 1-foot out at every 3-ft. down, the lowest course 8-ft. wide and 3½-ft. deep having a ¾-in. mild steel rod running along its centre. The intermediate or division wall is 4-ft. wide at the top with batters of 15 over 1 on a square base 8-ft. wide. The greater part of these chambers is on rock except at the south-west corner, where to prevent any chance of a breakaway, the foundation trench under the south and west walls was stepped down to a depth of about 25-ft. at the corner and this was filled with 1—2—3 cement concrete with displacers.

From the settling chambers the water passes through an 18-in. main to the inlet well of the service reservoir where it is measured over a rectangular weir 110-in. long, the depth on the weir being recorded automatically on a Kent float recorder fitted in the domed recorder house, a 1-in. pipe being laid between the inlet well of the reservoir and the float well of the recorder house for this purpose. An angle iron plate has also been fixed level with the top of the weir for check measurements. The water having passing over the gauge flows down an incline of 4¾ over 1 with curved bottom to the floor of the reservoir when empty without shock.

The reservoir is 205-ft. long by 190-ft wide at top water line made up of two semi-circles set off from centre points 15-ft. apart, these semi-circles being joined by a straight line of 15-ft. The mean depth is 22-ft. 6-in. and the capacity is four million gallons. The two outlet wells at the opposite end to the inlet well are provided with screens which can be lifted by an overhead chain block moving on an I-girder. The 18-in. draw-off valves between the reservoir and each outlet well are three in number, their inverts being 5, 13 and 21-ft. below top water level. The 12-in. scour or washout pipe fixed in the reservoir and the invert of which is at 24-ft. below top water level passes beneath the division wall of the outlet wells and to it are connected the 6-in. washout pipes from these wells.

The foundations of the reservoir are partly on solid granite, partly on granite badly fissured and partly on granite earth. Where on earth, the foundations are deeper by some 6-ft. and are stepped up to meet the higher foundations on the rock, and in one case the concrete work was carried up as much as 15-ft. with a straight vertical joint (provided with necessary grooves) so as to provide against subsequent settlement and cracking between the work on the earth and the work on the rock. The top of loose and fissured rock was taken off and the fissures filled with cement grout. When the concrete forming the wall foundations was being put in, care was taken to extend the concrete of the walls into the floor area a distance of about 3-ft. 6-in. and 12 inches deep to meet the lower layer of the floor and so make bond between the floor and the walls. The walls are of 1—2—3 cement concrete stepped on the inner face at the base for a height of 3-ft. and then with a batter of 4¾ over 1 to the top. The wall has a vertical back and in each course two ¾-in. mild steel rods were embedded horizontally and in addition one row of vertical rods of same diameter were placed 7-ft. 6-in. apart. These extended nearly the full height of wall and were hooked on to one of the lowest horizontal rods; otherwise they were free. The inner face is rendered with 1 to 1 cement mortar. There is no puddle either behind the walls or under the floor. The walls were built in courses 3-ft. high, bonded and grooved for water-tightness, the joint thoroughly picked, washed and spread with cement mortar before the next course was laid down.

The floor 21 to 24 inches thick was laid in three courses, the lower two courses of 1—2—3 cement concrete being put down in 15-ft. alternate squares, the second course breaking joint with the first; and finished with a 3-in. layer of crush concrete in the proportion of 1 cement to 1.636 granite crush, rammed, dusted with cement and floated to a smooth surface. This last layer was put down in panels 15-ft. by 7½-ft. which again broke joint with the second floor course. The floor has a slope of 1 in 200 from the inlet side to the outlet. Foundations 10-ft. square of 1—2—3 cement concrete have been put down beneath the floor at 40-ft. and 36½-ft. centres to take pillars should the reservoir ever be covered. The positions of the centres of these bases are marked by steel pins which project about 1 to 3 inches above the floor surface. When the reservoir was finished it was filled and allowed to stand for some days. It was then emptied and examined and found good. Water was again let in and it was filled to a depth of some two or three feet only. When this water was let out it was found that two fine cracks had developed along the joint of the floor with the wall where the wall and the floor were on soft. In one case about 3-ft. 6-in. off the wall and in the other along the face of the wall and probably on account of unequal expansion due to the upper wall being very hot and the floor being cool owing to the water on it. No trouble has been experienced owing to these fine cracks. The reservoir is cleaned once every year.

The domed recorder house, 15-ft. square inside, is built entirely of 1—2—3 cement concrete. The dome itself, 16-ft. inside diameter, made of blocks "cast" to shape on the ground, is 12-in. thick, a ¾-in. diameter steel rod being embedded in the circular course immediately below the dome.

The total cost amounted to some $280,000.

The cost of settling chamber excavation, running it to spoil and refilling behind walls amounted to 90 cents per cubic yard. This included 25 per cent. of rock.

The cost of service reservoir excavation running it to spoil and refilling behind walls amounted to 62 cents per cubic yard. This included about 5 per cent. of rock.

Cement concrete mixture 1—2—3 in floor and walls of settling chambers inclusive of rendering was $15.45 per cubic yard. Cement delivered on works was reckoned to cost $5.25 per cask of 375-lbs.

Cement concrete mixture 1—2—3 at service reservoir was $14.50 per cubic yard.

Fine concrete in floor 3-in. thick cost $2.10 per square yard.

Approximate overhead cost of 18-in. cast iron pipes complete, inclusive of trenching and refilling, specials and valves was $26.00 per lineal yard.

With regard to the method of working, it will be understood that there are no filtration works on the Penang water supply but care is taken to shut off the supply from the river whenever it is discoloured during rains. When the rainstorm lasts for the greater part of a day the reservoir is very much drawn down and it would be better from every point of view were the capacity of the service reservoir equal not to one day's supply but to three days' (or even five days' supply where the works are likely to be extended) and constructed in two halves, the water passing from one to the other.

Generally it may be said that the Penang water is of a very high quality chemically and would be so from a bacterial point of view also, were it not for the amount of pollution it receives from houses, cultivation and paths still existent on the catchment areas. Much has been done in the way of buying up houses and lands on these areas and it is hoped that the whole of the pollution will be removed in the course of time.

The distributary mains from the service reservoirs to town although probably large enough to supply th emaximum quantity which would be allowed for a supply of about4,000,000 gallons per day, are very much overtaxed wtih the result that pressures in the town at 8 o'clock in the morning are down to something like 15-lbs. per square inch all over the more densely populated part of the town. This means that upstair floors and even shipping have difficulty in getting water; and in case of fire in the daytime (although not at night) there is water shortage until blocks of the town have been shut off to reduce consumption and increase pressure which can be concentrated in the zone of fire. This too is a state of affairs which will be remedied in the course of time by the laying of new distributary mains probably from new sources of supply.

Prai Water Supply

2

Paper Read Before the Engineering Association of Malaya

By D. W. Brisbane, Assoc. M. Inst. C E.

AT the present time Prai does not possess a sufficient water supply and practically all the water required by the railway department and other large users is obtained either by rail or water boat.

With the completion of the new wharves at Prai, shipping and other additional demands will have to be met and in order to provide for all these requirements the Prai water supply scheme is now being constructed.

The scheme comprises a masonry dam and storage ersevoir at Bukit Serayah, a pipe line to Prai, an elevated storage tank and service mains at the latter place, and is designed to supply 500,000 gallons per day.

Catchment Area

The catchment area is situated on the southern slope of Bukit serayah and has an area of 217 acres.

The surface slopes are steep; but except for very small areas, are covered with soil. Over a considerable portion of the area small terraces—with dry stone retaining walls—have been constructed by the early spice growers and cultivators. At present the catchment is covered with a growth of coconuts, penang palms, fruit trees and blukar.

No rainfall records for the catchment area are available but we have the following for comparison.:—

PARIT BUNTAI (15 miles distant).	
Mean annual rainfall since 1888	95.7-in.
BUKIT MERTAJAM VILLAGE (3 miles distant).	
Mean annual rainfall since 1912	95.3-in.
PARI RIVER WHARVES (11 miles distant).	
Mean annual rainfall since 1918	106.3-in.

It is considered that the rainfall at Bukit Serayah is not less than at Parit Buntar, and a mean annual precipitation of 95.7 inches and a minimum of 65 inches have been assumed for the catchment.

In a year of minimum rainfall the total yield from 65 inches would be 319,000,000 gallons, which would give an estimated run-off of 185,000,000 gallons.

Gaugings of the stream at dam site have been taken since December 1920 and a minimum daily flow of 304,000 gallons has been recorded to date. This occurred on 30th August last after about three months of fairly dry weather. The dry weather gaugings always record a larger flow in the mornings than in the afternoons.

The water was submitted to a chemical and physical examination by the institute of medical research, Kuala Lumpur, and was found to be of considerable organic purity and the analysis did not disclose any reason why the water should not be suitable for domestic use.

The oxygen-absorbed figure was low and very little chlorine or free ammonia was present. Only a trace of nitrates was found, and contamination from animal sources is evidently very slight and not of recent origin.

The total solids per 100,000 parts was 6.05. Permanent hardness was 1.95 and temporary hardness nil. The water should therefore by very suitable for boilers. It is very slightly alkaline.

Appendix No. 1 contains the institute's report on this water.

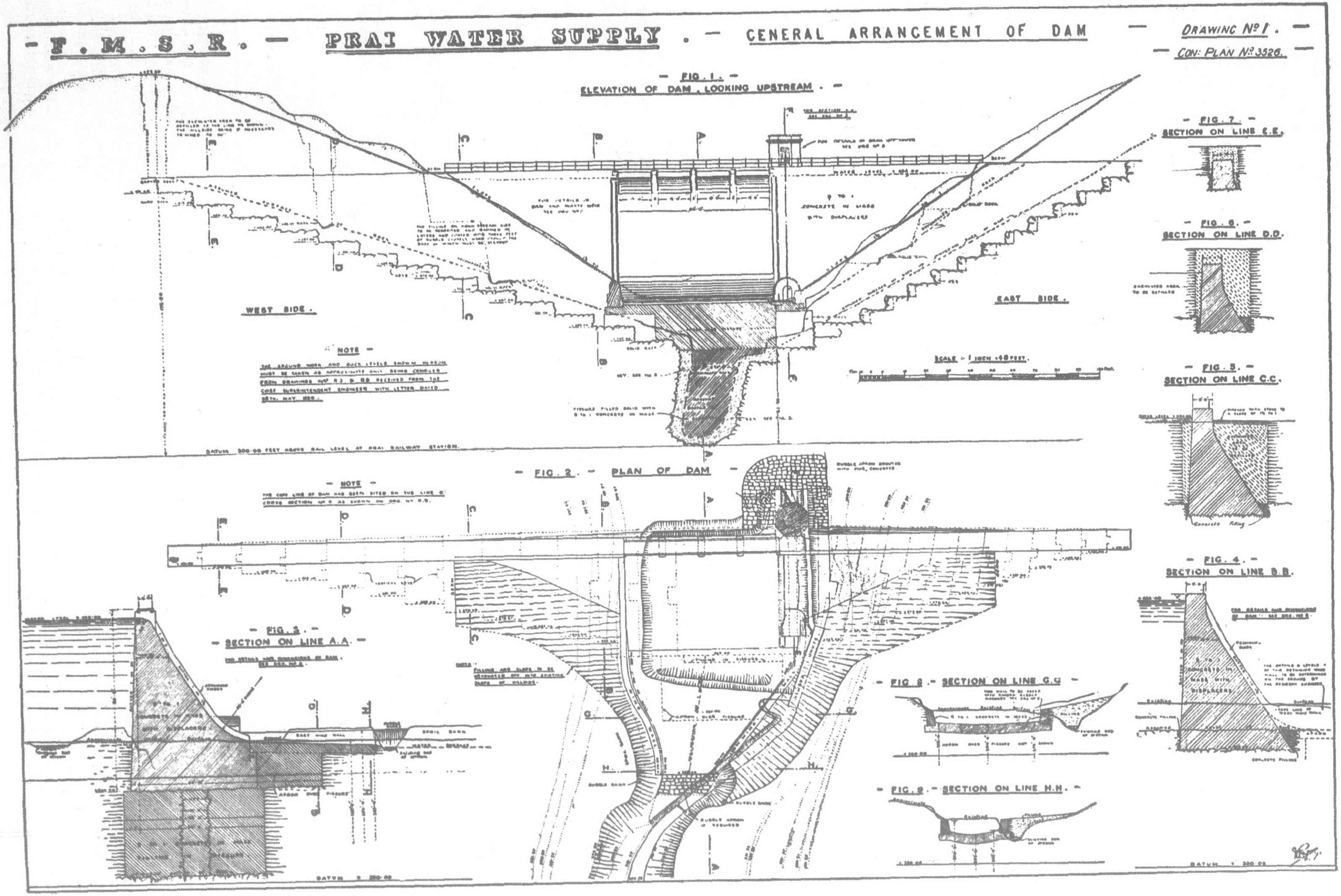
The whole of the catchment area has been acquired and all dwellings are being removed or destroyed in order to avoid the risk of contamination.

Reservoir

The minimum annual run-off available for storage is estimated at 185,000,000 gallons. Evaporation, absorption and other losses are expected to amount to 35,000,000 gallons, leaving a gross available supply of 150,000,000 gallons. Deducting from the last figure the quantity in bottom of reservoir that cannot be drawn off—the nett available supply is 147,000,000 gallons.

The reservoir has been designed to have a capacity of half this amount and the actual nett capacity of the reservoir when complete will be 72,000,000 gallons.

This is enough for 4½ months supply at the maximum daily draft of 500,000 gallons, and as the rainfall is distributed throughout the year it is considered sufficient.


-F.M.S.R.- PRAI WATER SUPPLY. — GENERAL ARRANGEMENT OF DAM —
DRAWING No 1.
CON: PLAN No 3526.
- FIG. 1. -
ELEVATION OF DAM, LOOKING UPSTREAM.
WEST SIDE.
EAST SIDE.
- NOTE -
THE GROUND WORK AND ROCK LEVELS SHOWN HEREON MUST BE TAKEN AS APPROXIMATE ONLY BEING COMPILED FROM DRAWINGS NOS R3 & R8 RECEIVED FROM THE CHIEF SUPERINTENDENT ENGINEER WITH LETTER DATED 28TH. MAY 1920.
DATUM 300.00 FEET ABOVE RAIL LEVEL AT PRAI RAILWAY STATION.
SCALE: 1 INCH = 40 FEET.
- FIG. 2. - PLAN OF DAM
- NOTE -
THE COPE LINE OF DAM HAS BEEN SITED ON THE LINE OF CROSS SECTION No 6 AS SHOWN ON DRG. No R.3.
- FIG. 3. -
SECTION ON LINE A.A.
- FIG. 7. -
SECTION ON LINE E.E.
- FIG. 6. -
SECTION ON LINE D.D.
- FIG. 5. -
SECTION ON LINE C.C.
Concrete Filling
- FIG. 4. -
SECTION ON LINE B.B.
FIG. 8. - SECTION ON LINE G.G.
FIG. 9. - SECTION ON LINE H.H.
DATUM = 300.00
A
B
C
D
E
G
H

Another factor in determining the capacity of the reservoir was the foundation of the dam on the western side, where the solid rock only rises to about R. L. 424—the level now fixed for the spillway.

The surface area of the reservoir when full will be eleven acres.

The site is situated below the junction of two small streams and between two fairly steep spurs. Below this sites the valley falls very quickly.

The dam is of the gravity type and is to be constructed in cement concrete to the section shown on plan.

The maximum height from toe to spillway level at any section will be about 80-ft., and the maximum available depth of water when reservoir is full will be 55-ft.

The total crest length will be about 450-ft., including a spillway 60-ft. wide. The coping of spillway is 424-ft. above rail level at Prai station.

The calculated maximum pressure on upstream toe when reservoir is empty is 4.99 tons per square foot.

With the reservoir full and overflowing to a depth of one foot over spillway the maximum pressure on down stream toe becomes 5.40 tons per square foot.

The weight of the concrete for these calculations has been taken at 150-lbs. per cubic foot. The concrete specified is a 1 to 5 mix with granite displacers.

The lines of resultant pressures are within the middle third as indicated on the section.

The foundation of the dam is granite, but unfortunately a large fissure about 30 to 40-ft. wide extends across the site and runs approximately parallel to the general direction of the valley. A trial shaft bottomed on rock at about 70-ft. below the surface. The fissure is now being excavated and has reached a depth of about 50-ft. below the original surface. The material filling the fissure is decomposed granite. The government geologist has examined the site. He reports that this extent of softening is not unusual and considers that the decomposition is due to an absence of clay cover and to the chief joints in the granite being parallel to the valley.

A concrete apron over fissure is to be provided on downstream side of dam and will extend far enough away to minimise the risk of erosion at the toe.

A footway 6-ft. wide is to be constructed across the dam with a reinforced concrete gantry over the spillway.

The draw-off tower is to be built of concrete with cast iron lining, and fitted with four 10-in. dia. intake valves at different levels, and a 24-in. sluice valve. A grating and 40-in. flap valve will admit the water to sluice valve. A tunnel through the dam will carry the 10-in. supply main through dam from draw-off pipe. It will also carry the waste water from sluice.

A valve house of dressed granite ashlar with necessary fittings is to be built on top of draw-off tower.

Pipe Line

A 10-in. dia. cast iron main will convey the water from the reservoir to an elevated storage tank at Prai, a distance of 10½ miles, and is calculated to deliver 38,000 gallons per hour or 916,000 gallons per day.

The discharge has been calculated by Kutter's formula with a co-efficient of roughness of .013.

Direct from the 10-in. supply main—at foot of storage tank—a 7-in. cast iron service main leads to the outer end of jetty and is to be fitted with the necessary valves, hydrants, etc. At the outer end of jetty a Glenfield and Kennedy water tower with radial arm is to be fixed for the rapid filling of the water boats.

Service mains are also to be laid for railway and other requirements.

The arrangements of valves at the storage tank will permit of the supply for the 7-in. jetty main being drawn therefrom—whenever required—instead of direct from the 10-in. supply main.

The discharge rates of 7-in. service main at outer end of jetty will be

(1) Drawing direct from 10-in. main—30,000 gallons per hour =130 tons per hour.

(2) Drawing from storage tank—17,000 gallons per hour=76 tons per hour.

The maximum head on the pipes will be 420-ft. The pipes are of the spigot and socket type with lead joints. They are tested to a pressure of 800-ft. head and receive a coating of Angus Smith composition.

Storage Tank at Prai

The elevated storage tank proposed is to consist of three cast iron tanks capable of being used singly, in pairs, or altogether. The total capacity of the tanks will be 110,000 gallons.

They are to be supported on reinforced concrete columns 50-ft. high. The foundations are to be piled.

Supply of Water to Shipping

Appendix No. 2 gives particulars of the supply of water to shipping at port of Penang. These particulars were obtained from the manager, Penang harbour board, by the chief superintendent engineer.

Construction

Transport.—The site of the reservoir is about four miles from the nearest railway station—Bukit Mertajam—and a fleet of motor lorries provides transport from the railway to foot of approach to site.

Owing to the steepness of the approach to the reservoir site, it has been necessary to provide inclines worked with winding engines. Two double track inclines have been constructed with a winding engine at top of each.

The first incline is 1,100 feet long and rises 200-ft. and the second one is 700-ft. long and rises 165-ft.

A petrol locomotive has been provided for the haulage of materials from top of inclines to the dam site, a distance of about ¾ mile. A second loco of the same type will provide haulage power from the quarry site.

Quarry

A granite quarry is being opened up about half a mile from the dam site. A complete plant, consisting of an Ingersoll-Rand compressor of 528 c.ft. per minute capacity, a Leyner drill sharpener, rock drills, crushers and crane has been obtained. An ample supply of small and large stone is expected from this quarry.

Concrete Plant

Two concrete mixers of 1 c.yd. capacity each will supply the concrete, and two cranes have been provided for work at dam.

It is proposed to build a trestle on downstream side of dam to carry the cranes that will lower the concrete into place, with exception of that required for fissure.

The latter concrete will be mixed by machine alongside of fissure and lowered directly into place from there.

Workshops

The necessary workshops are now being erected. The carpenters' shop will be equipped with saws, planing machines, etc., to deal with the shuttering.

Water Supply

A small gravity supply provides for all construction requirements.

Materials

Stone is obtained from the quarry.

Sand is not obtainable locally in any quantity, and practically all of it will be sea sand brought by tongkangs to Prai and from there delivered by rail to Bukit Mertajam.

Cement is being obtained through the crown agents and is again tested locally by the consulting engineers.

Labor

Most of the labor employed on the works is Chinese. For some special portions of the work other nationalities are employed. The health of the labor force has been causing some anxiety owing to prevalence of malaria, and is receiving special attention.

Estimate

The estimated cost of the works is $2,186,900.

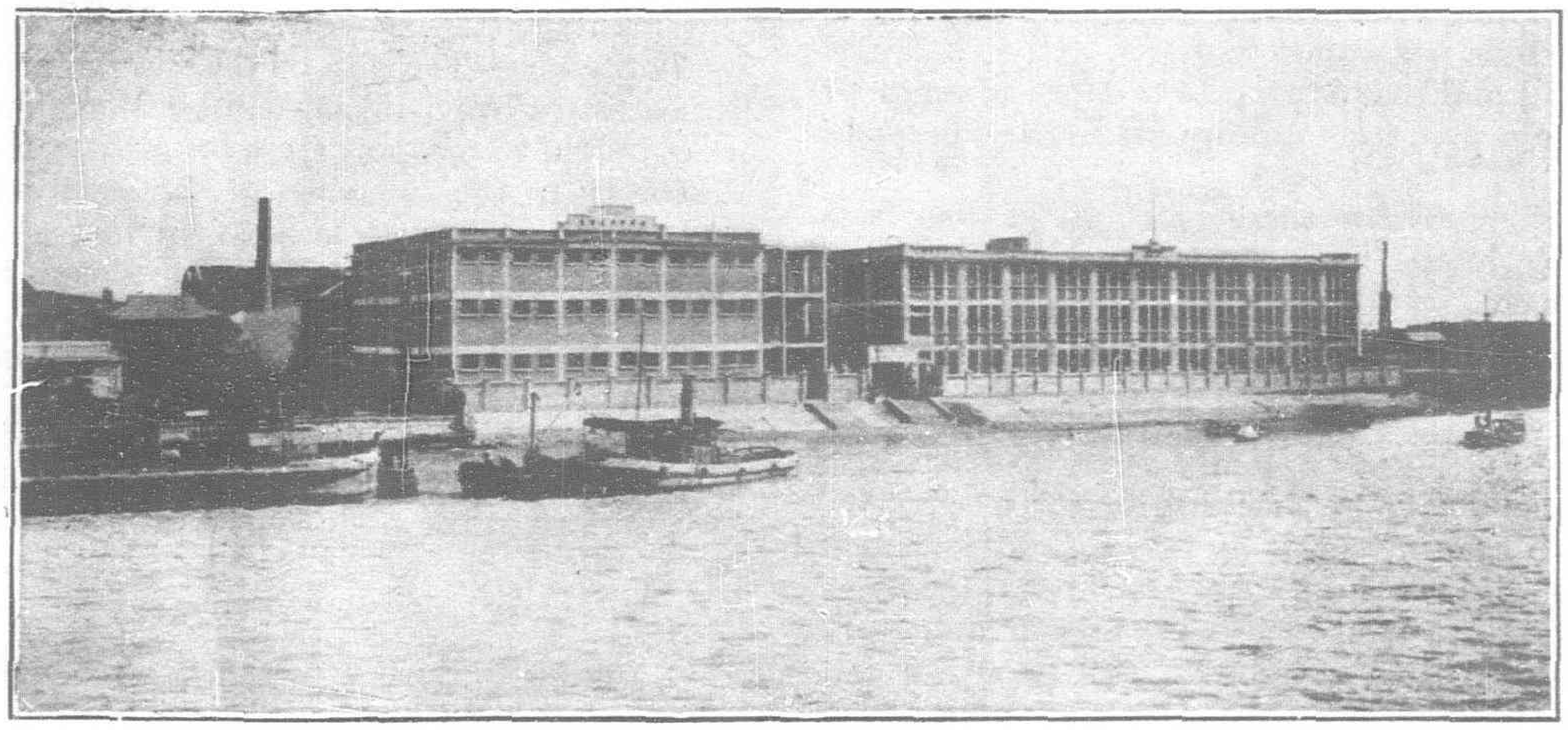
(Continued on page 603).

China's Cotton Industry.—2

By *Theodore Chen, B.A.*

II. The World's Cotton Supply and Demand

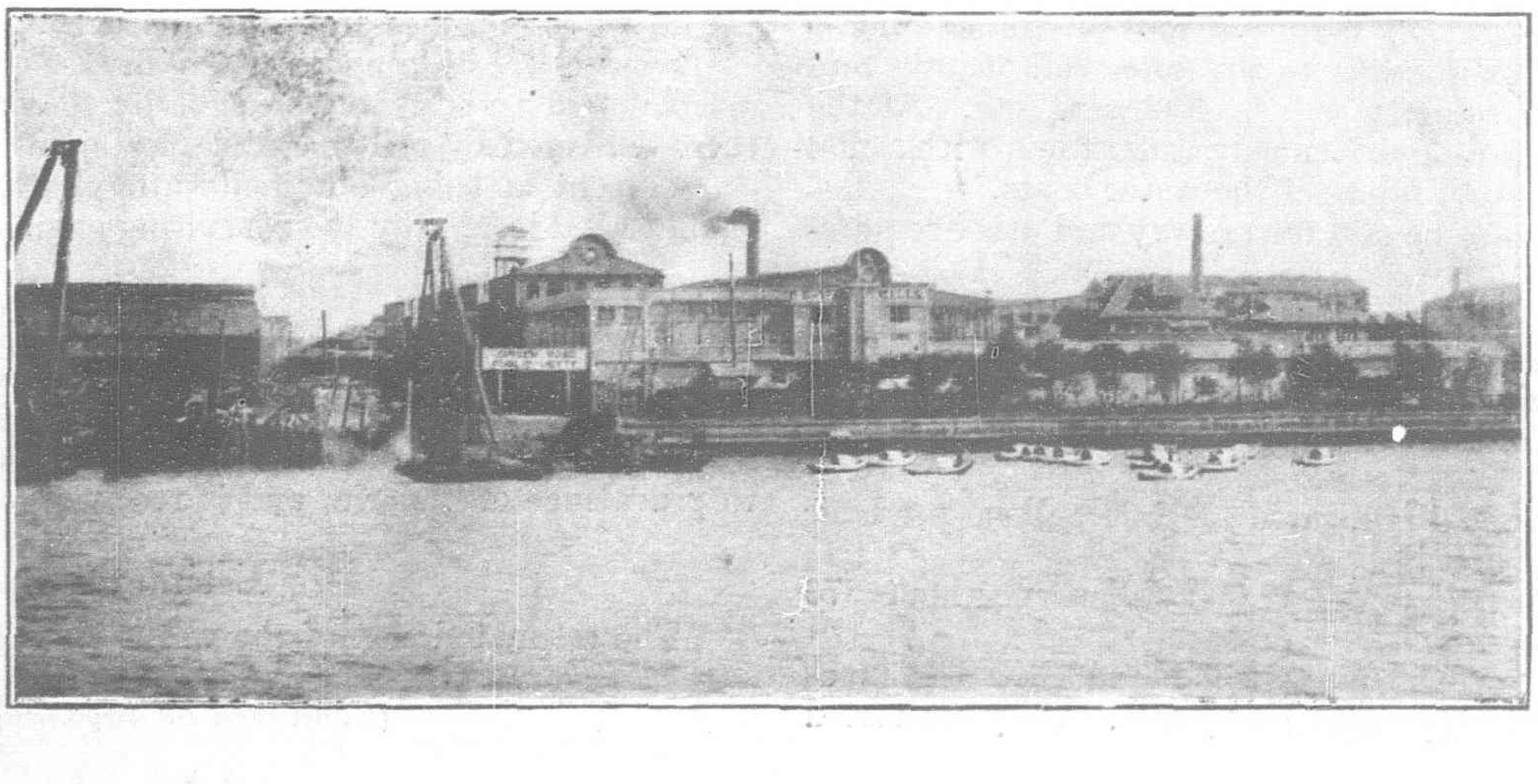
THE world's cotton consumption is growing year by year and a shortage of supply is always keenly felt. If the *per capita* consumption is 15-lbs. of raw cotton, then a world population of 15,000,000,000 needs 45,000,000 bales (4 piculs a bale) to supply the demand. The production of the last decade ranges, however, only from 7,000,000 to 26,000,000 bales. The demand is far above the supply. The British empire has a very far-sighted policy in investing a large amount of capital for the raising of more and better cotton in Egypt, South Africa and India. It is evident that rapid development is about to take place in the cotton manufacturing industry in China and an enormous amount of raw cotton is needed.



The following table shows the number of spindles, production and consumption of cotton in different countries from March, 1919 to June, 1920 :—

Countries	Spindles	Production (in bales)	Consumption (in bales)
Great Britain ...	6,692,410	1,139,000	3,185,314
India	6,689,680	4,316,000	1,695,365
Canada	1,200,000		118,446
U.S.A.	35,872,000	11,000,000	6,425,244
Mexico	720,000	200,000	44,321
Russia		420,000	
Brazil	1,600,000	536,000	75,552
Peru			
China	1,600,000	1,100,000	690,398
Japan	3,600,000	150,000	2,082,432
Belgium ...	1,572,500		3,124,906
France	9,400,000		
Germany... ...	9,400,000		
Italy	4,514,800		
Jugo-Slav ...	3,584,420		
Spain	1,800,000		
Other Countries	5,115,582		
Total ...	145,701,462	19,842,000	17,236,941

The above table indicates that only the United States, China, India and Brazil are sufficiently supplied with their own production, while others are all dependent upon the four leading producing countries for their consumption. With the rapid development of cotton manufacturing and keen competition in the near future, it is really a grave problem for the world to face in regard to the supply of raw cotton. According to the latest available statistics, the number of spindles in the United States, Great Britain and Japan are rapidly increasing in the following manner:—



Countries	1907	1919	1920	Av. Annual Increase
U. S. A.	26,350,000	34,200,000	34,700,000	600,000
Great Britain ..	50,700,000	59,000,000	59,300,000	470,000
Japan	1,500,000	3,200,000	3,400,000	140,000

The above figures indicate clearly the rapid growth of cotton industry and it is natural for China, the most hopeful cotton-producing country, to exert greater efforts in the cultivation of cotton in order to relieve the sure to come world's cotton shortage. According to expert investigation, China is capable of yielding more than 20 catties of cotton on each *mow* of land, while the United States 25, Egypt 20 and India 12½. In 1921 there were over 28 million *mow* of land under cotton cultivation. If this acreage is to be extended to 150 million *mow* in the future with an average yield of 20 catties per *mow*, the yield of cotton in China will be 7,500,000 bales (400 catties each) or easily to 10,000,000 bales. Since China is producing, without any special effort of the people, with very little help from her government and lack of scientific knowledge in cultivation, a crop equal to possibly a seventh of that of the United States, there is every evidence to see that it would be no great task for China to become the world's greatest cotton country.

III. Cotton Goods Trade in China

On account of the enormous population of China and the mild climate throughout the country, a very large amount of cotton goods is required for clothing. This makes naturally the imports of cotton manufactures by far the largest single item in foreign trade. During 1922 the import of cotton goods from foreign countries amounted to 22,978,286 pieces and valued at Hk. Taels 218,523,000

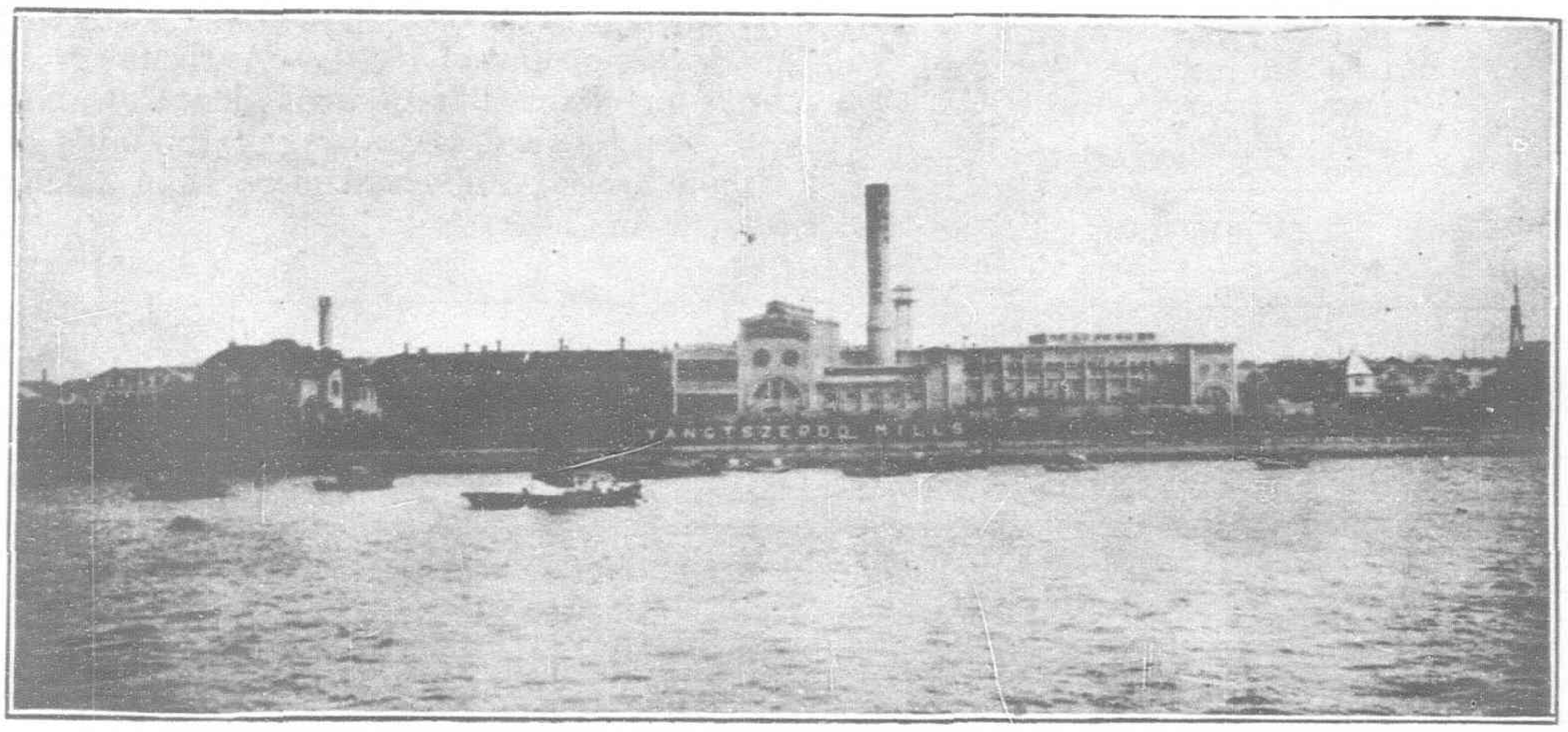
The table on next page shows the value in Hk. taels of the import into China of all trades and of cotton manufactures and the percentage that the latter bears to the total import trade during the years 1880-1918.

Year		Total imports of all articles	Import of cotton manuf.	Per cent. of total
1880...	...	79,293,452	23,382,957	30.54
1881...	...	91,910,877	26,045,836	28.34
1882...	...	77,715,228	22,706,784	29.21
1883...	...	73,567,702	22,046,785	30.00
1884...	...	72,760,758	22,141,222	30.43
1885...	...	88,200,018	31,493,823	35.70
1886...	...	87,479,323	29,114,622	33.28
1887...	...	102,263,669	37,041,931	36.23
1888...	...	124,782,893	44,437,525	35.61
1889...	...	110,884,355	36,135,596	32.60
1890...	...	127,093,481	45,020,302	35.41
1891...	...	134,003,863	53,290,200	39.76
1892...	...	135,101,198	52,707,432	39.71
1893...	...	151,362,819	45,137,970	29.82
1894...	...	162,302,911	52,105,448	32.14
1895...	...	171,696,715	53,074,164	30.99
1896...	...	202,589,994	79,243,431	39.12
1897...	...	202,828,625	78,663,280	38.78
1898...	...	209,579,334	77,618,824	37.04
1899...	...	264,748,456	103,463,048	39.07
1900...	...	211,070,422	75,606,360	35.82
1901...	...	268,302,918	99,651,999	37.14
1902...	...	315,363,905	127,524,120	40.43
1903...	...	326,739,133	128,625,604	39.36
1904...	...	344,060,608	124,048,311	36.05
1905...	...	447,100,791	181,452,953	40.58
1906...	...	410,270,082	152,727,845	38.41
1907...	...	416,401,369	118,915,923	28.56
1908...	...	394,505,478	110,898,379	28.11
1909...	...	418,158,067	137,288,196	32.83
1910...	...	462,294,894	130,679,235	28.22
1911...	...	471,503,943	143,802,025	30.50
1912...	...	473,097,031	144,088,874	30.45
1913...	...	570,162,557	182,419,023	31.99
1914...	...	569,241,382	183,328,473	32.21
1915...	...	454,475,719	149,300,513	32.85
1916...	...	516,406,995	136,679,386	26.47
1917...	...	549,518,774	158,950,267	28.93
1918...	...	554,893,082	151,380,423	27.28

The following figures show the growth of imports of cotton goods from abroad in Hk. taels into China during the years of 1913, 1921 and 1922:

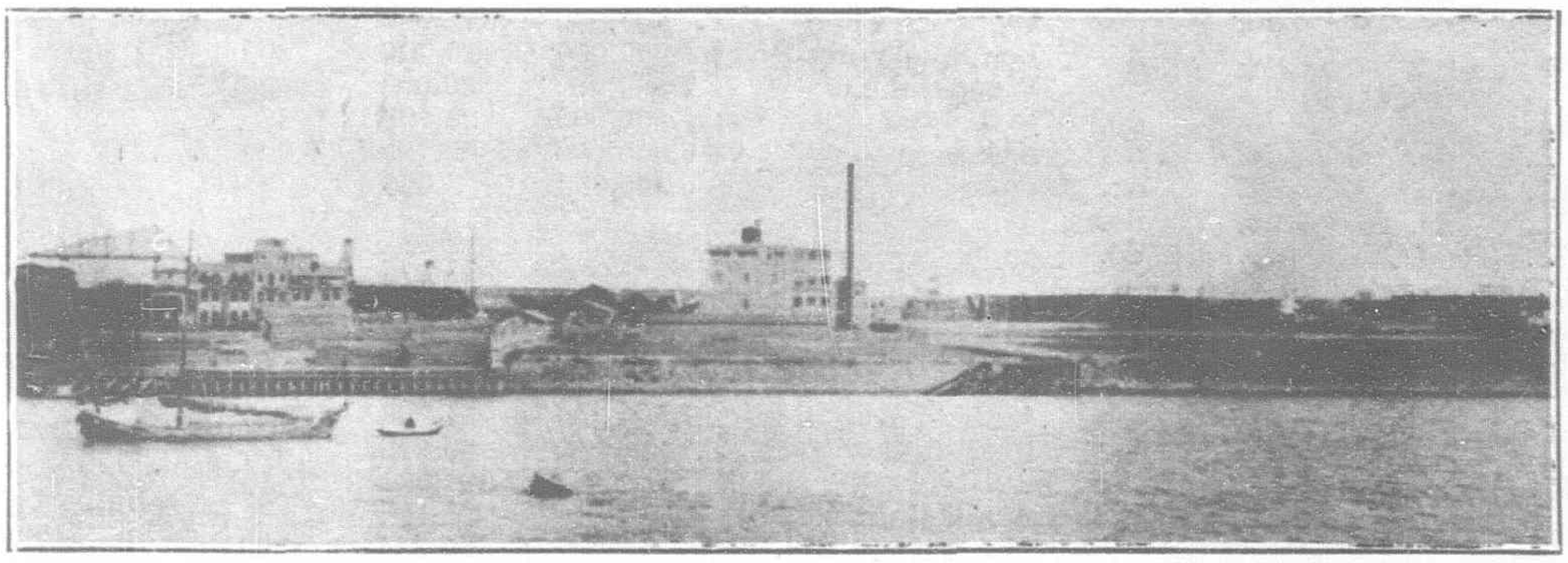
1913—182,420,000;
1921—208,663,000;
1922—218,523,000.

Shanghai is by far the most important port of enter for cotton goods, followed by Tientsin, Dairen, Hankow, Swatow, Kiaochow, Canton, Wuchow, and Mengtsz.



The principal sources of supply for the large volume of cotton manufactures consumed in China are England, Japan, India, the United States and Russia, with smaller quantities from France, the Netherlands, Canada, Germany and Italy. The true origin of the imports into China is difficult to determine because of the intervening ports of transhipment, particularly Hongkong, Antwerp and Hamburg.

It is most gratifying to say that in 1922 China instead of importing a little over 200,000,000 Hk. taels worth of cotton goods from abroad annually, exported to foreign countries various kinds of cotton piece goods in addition to Hk. Taels 150,521 of cotton yarn. It is easy to see that China will soon export a large quantity of cotton manufactures since there is an abundant and cheap supply of labor and raw material.



IV. Cotton Manufacturing in China

Cotton manufacturing in China, in a modern sense, is of comparatively recent development. Before 1890 cotton spinning and weaving in China, there was only the so-called "household handcraft" type. It was in 1889 that Li Hung-chang, the noted diplomat of the Manchu dynasty, launched a campaign, under his official capacity as viceroy of Peiyang for the erection of a modern cotton mill, under the name of "Foreign Cloth Factory" which was most unfortunately destroyed by fire after three years' careful planning and construction. The Modern Spinning and Weaving Factory which started at the same time was completed, however, in 1890. Li's plan was later on brought up before the attention of Sheng Kung-pao who was at that time a Tientsin customs' governor general, Sheng was fully aware of the importance of such an establishment, consequently he took up the responsibility for raising Tls. 800,000 by public subscription. As a matter of fact, Chinese merchants at that time were unfamiliar with the idea of subscription by shares, and cotton spinning and weaving by machinery was quite novel to them. Hence they were not bold enough to make generous subscription and only one-third of the required capital was paid up. While the construction of the mills was under way and the order for 65,000 spindles and 600 looms was being placed, the balance of the required capital was arranged for by other means. The mill was completed in 1894, with a new name as Hwa Shen Cotton Mill. In 1891, Chang Tze-tung also started a weaving factory in Wuchang and in 1894 added a spinning factory.

After the Sino-Japanese war, with the conclusion of Shimenoseki treaty of 1895, foreigners were then permitted "to engage in all kinds of manufacturing industries in all the open cities, towns and ports of China," according to Article VI of the said treaty. This made another epoch in the history of cotton manufacturing in China. Those foreign firms like Jardine, Matheson & Co., Ilbert & Co. (British) and Arnhold, Kerberg & Co. (German) who originally were engaged in piece goods and cotton yarn business, suddenly stepped into cotton manufacturing enterprises and cotton mills under the names of Ewo, Laou Kung Mow, Hung Yuen and Shui Kee were established in Shanghai. This movement had a great influence upon the Chinese merchants, who realized more and more the importance of the cotton manufacturing industry, and mills were then established in many provinces. Up to 1896, there were already five mills owned by the Chinese, namely Ta Shun and Yui Yuen of Shanghai, Nieh Cheng of Wusih, including Modern Spinning and Weaving Factory and Hwa Shen Cotton Mill of Shanghai, and the four foreign mills, making a total of nine mills. Then followed later on the establishment of Soo Lun in Soochow, Ta Sung in Nantung, and Yui

Tung and San Tai (Japanese) in Shanghai. At the same time Ta Shun was sold to Japanese interests and changed into Shanghai Cotton Spinning and Weaving Mill No. 1 and San Tai as Mill No. 2. This marks the invasion of Japanese competition into the cotton manufacturing field of China.

It is to be noted that although cotton spinning was making quite rapid strides during such a brief space of time, yet nothing was done to encourage weaving. At the conclusion of the Russo-Japanese war of 1906, piece goods found a good market in Manchuria and China Propei as well. This influenced most of the mills to install weaving machinery and resulted in a large output of shirtings and jeans.

The following table shows the mills established during the Manchu dynasty :—

Name	Site	Nationality	Est.	Spindles	Looms	Remarks
Hengfoong	Shanghai	Chinese	1890	15,576	356	Originally known as Modern Spinning and Weaving Factory
Jihcheng ...	,,	,,	,,	65,520	600	
Yueyuen ...	,,	,,	1895	26,936		
Yuetung ...	,,	,,	1898	18,200		
Chinghwa ...	,,	,,	1905	11,648		
Tungchong .	,,	,,	1908	11,200		
Ewo ...	,,	British	1895	72,354	524	
Laoukungmow	,,	,,	,,	30,548		
Hongyuen...	,,	,,	,,	40,000	300	
Kungyik ...	,,	,,	1910	25,576	400	Sino-British in management
Shuikee ...	,,	German	1895	40,768		
Shanghai 1...	,,	Japancse	,,	20,392	376	
,, 2...	,,	,,	1900	25,480	510	
Kiucheng ...	,,	,,	1907	9,424		Sino-Japanese in management
Naigai Wata	,,	,,	1911	23,040		
Nihcheng	...Wusih	Chinese	1895	13,832		
Chinghsing .	,,	,,	1906	10,192		
Soolung	...Soochow	,,	1897	22,568		
Tasung 1	...Nantung	,,	1899	40,500		
,, 2	...Tsungming	,,	1907	26,000		
Yuetai	...Changsuh	,,	1906	10,192		
Tsitai	...Taichang	,,	1907	12,700		
Liyung	...Kiangyin	,,	1908	15,000		
Total ...				587,646	3,066	

Within a period of two decades (1890-1911), as indicated in the foregoing paragraphs, the cotton manufacturing industry in China had grown up into 23 mills with 587,646 spindles and 3,066 looms. Its progress, however, was checked by the revolution of 1911, when the nation was in such a chaotic situation that it nearly ruined the cotton industry. Fortunately during the European war, the importation of cotton yarn and piece goods from abroad decreased to such an extent that it enabled the cotton mills in China to have a good market for their productions. Up to the present time there are 120 mills with 3,550,108 spindles and 27,514 looms, which compared with that of Manchu dynasty shows an increase of 500 per cent.

The following table shows the yearly progress of cotton mills in China :—

Year	Mills	Spindles	Year	Mills	Spindles
1891	11	65,000	1916	42	1,145,000
1896	12	417,000	1918	49	1,478,000
1902	17	565,000	1919	54	1,650,000
1911	32	831,000			

The following table shows roughly the yearly progress of yarn production in China (lack of accurate statistics, this is taken from the Chinese Bankers' Association Magazine) :—

Year	Production	Year	Production
1907	900,000	1911..	750,000
1908	1,050,000	1912..	1,200,000
1909	1,050,000	1913..	1,200,000
1910		1914..	1,600,000

It is evident that China in the past 40 years had no spinning and weaving mills in a modern sense. In the past 30 years the Chinese yarn market was entirely controlled by the Indian yarn. At this time, Chinese were beginning to erect cotton mills. In the past twenty years there has been a great influx of Japanese yarn into China. Until 1914 the Japanese practically held the yoke of yarn business in the Far East. On account of the European war, the output of Japanese yarn was greatly reduced and prominent merchants like Chang Chien, C. C. Nieh and H. Y. Moh began to step forward, organizing cotton mills and up to the present time there are 120 mills and more than 3,550,108 spindles and 27,514 looms in China.

The following is a list of all the mills in China :—

Name	Site	Nationality	Estab.	Proprietor or Manager	Capital	Spindles	Looms	Employees	Cotton Consumption	Power
Heng Foong Cotton Mfg. Co....	Shanghai	Chinese	1890	C. C. Nieh	T. 900,000	41,280	454	2,872	98,172	Electric
San Sing do.	do.	do.	do.	E. Y. Sheng	T.1,500,000	69,880	1,000	4,887	146,000	Electric & Steam
Ching Hwa do. ...	do.	do.	1905	Sih Wen Tai	T. 300,000	13,548		700	28,000	Steam
Shun Hsing Cotton Mill 1 ...	do.	do.	1916	Yung Tsung Ching	$ 3,000,000	39,752	1,100	4,000	82,500	Electric
do. do. 2 ...	do.	do.	1919	do.	$ 1,000,000	34,934		1,850	41,000	Electric & Steam
Teh Dah Cotton Spinning Co.	do.	do.	1915	Moh Su Tsa	T.1,000,000	29,388		834	43,000	do.
Hong Yue Cotton Mill ...	do.	do.	1916	Chen Bei Tse	T.1,800,000	43,900	240	3,400	80,580	do.
Poh Yik Cotton Mill 1 ...	do.	do.	1917	Zee Zing Ren	T.1,000,000	27,720		1,600	60,000	do.
do. do. 2 ...	do.	do.	1922	do.	T.1,000,000	24,000	500			do.
Hou Sung Cotton Mfg. Co. ...	do.	do.	1918	H. Y. Moh	T.1,200,000	61,792	396	2,800	74,304	do.
Pao Zung Cotton Mill 1 ...	do.	do.	1919	Liu Pah Sung	T.1,600,000	41,472	200	2,500	140,580	do.
do. do. 2 ...	do.	do.	1921	do.	T.2,400,000	69,952		4,300	223,650	do.
Wei Tung do. ...	do.	do.	do.	Chen Yuoh Ting	$ 1,200,000	23,808	200	1,200		do.
Dong Chong do. ...	do.	do.	1908	Sung Ming Yen	T. 335,000	11,592		760	26,495	do.
Tung Yik do. ...	do.	do.	1921	Wu Ling Su	T.1,800,000	45,912		3,400	116,650	do.
Heng Da do. ...	do.	do.	do.	Moh Su Tsa	$ 1,000,000	15,552		970		do.
Hwa Foong Cotton Mfg. Co....	do.	do.	do.	C. T. Wong	T.2,000,000	25,000		1,000		do.
Ta Chung Hwa Cotton Mfg. Co.	do.	do.	do.	C. C. Nieh	T.3,000,000	45,000		2,200	41,946	do.
Yung Yue Cotton Mill ...	do.	do.	do.	Hsu Song Chun	T. 400,000	12,000		280		Steam
Ta Foong do. ..	do.	do.	do.	Loh Wee Yung	$ 1,000,000	20,736	200	1,500		Electric
Ching Tai do. ...	do.	do.	do.	Wong Chi Yu	T. 800,000	30,000				do.
Hong Chang Cotton Mfg. Co...	do.	do.	do.	B. T. Chen	T.1,500,000	25,808	260			do.
Wing On do. ...	do.	do.	do.	Koh Shun	$ 6,000,000	60,720	1,000			
Ming Sung Cotton Mill ...	do.	do.	do.		$ 300,000	5,000				
Tsung Sing do. ...	do.	do.	do.							
Chin Wei do. ...	do.	do.	do.							
Total Chinese-owned Mills in Shanghai 26						828,746	6,140			
Ewo Cotton Mill	Shanghai	British	1895	J. M. & Co.	T.6,000,000	73,952	1,900	13,000	300,000	Steam
Yangtszepoo Cotton Mill ...	do.	do.	1914	do.		56,532				
Kung Yik Cotton Mill ...	do.	do.	1910	do.		25,576				Steam
Oriental Cotton S. &. W. Co....	do.	do.	1895	Arnhold & Co. Ld.	T.1,500,000	54,768	440			Electric & Steam
Laou Kung Mow do. ...	do.	do.	do.	Ilbert & Co.	T. 800,000	50,096	500			Steam
Total British-owned Mills in Shanghai 5						260,924	2,840			
S'hai Cotton Mfg. Co. Mill 1...	Shanghai	Japanese	1908	Mitsui Bussan Kaisha, Ltd.	Y.4,000,000	20,392	376	7,677	272,580	Electric & Steam
do. do. 2...	do.	do.	do.	do. do.		25,480	510			Steam
do. do. 3...	do.	do.	do.	do. do.		50,592				do.

Name	Site	Nationality	Estab.	Proprietor or Manager	Capital	Spindles	Looms	Employees	Cotton Consumption	Power
Japan-China S. & W. Co. 1 ...	Shanghai	Japanese	1895		Y.10,000,000	42,000				Steam
do. do. 2 ...	do.	do.				11,056	500			
do. do. 3 ...	do.	do.				30,000				
Naigai Wata Kaisha, Ltd. 3...	do.	do.	1911			23,040				Electric
do. do. 4...	do.	do.	1913			41,536				do.
do. do. 5...	do.	do.	1915			65,420				do.
do. do. 7...	do.	do.					600			
do. do. 8...	do.	do.				20,416				
do. do. 9...	do.	do.				26,936	1,000			
do. do. 12...	do.	do.				20,800				
do. do. 13...	do.	do.				24,000				
do. do. 14...	do.	do.				24,000				
Toyoda Cotton S. & W. Co. 1	do.	do.				30,720				
do. do. 2	do.	do.				15,312				
Doko Cotton Mill	do.	do.				58,240				
Kung Ping Cotton Mill ...	do.	do.				40,704				
Dah Kung do. ...	do.	do.				27,372				
Tokwa Boseki K.K. Mill 1 ...	do.	do.			$ 9,000,000	10,000				
do. do. 2 ...	do.	do.				15,360				
do. do. 3 ...	do.	do.				20,000				
Toyo Cotton Mill	do.	do.				50,000				
Total Japanese-owned Mills in Shanghai 24						693,376	2,986			
Naigai Wata Kaisha, Ltd. 6...	Tsingtao	Japanese				20,000				
do. do. 10...	do.	do.				20,000				
do. do. 11...	do.	do.				23,200				
Dai Nippon Cotton Mill 1 ...	do.	do.				25,344				
do. do. 2 ...	do.	do.				25,000				
Nisshin Boseki K.K. Mill ...	do.	do.				30,000				
Fuji Cotton Mill	do.	do.				30,000				
Kung Dah Cotton Mill ...	do.	do.				40,000				
Nagasaki Cotton Mill... ...	do.	do.				20,000				
Da kung Cotton Mill	do.	do.			Y.3,000,000	50,000				
Liao Yang Cotton Mill ...	Mukden	do.			Y.10,000,000	30,000				
Total Japanese-owned Mills in Outports 11						293,544				
Ta Snng Cotton Mfg. Mill, 1...	Nantung	Chinese		Chang Chien	T.2,500,000	77,380	700	5,000	160,700	Steam
do. do. 2...	Tsungming	do.		do.	T.1,200,000	35,000	200	2,000	72,000	do.
do. do. 3...	Haimen	do.		Chang Cha	T.2,000,000	34,000	420	2,300	126,000	
do. do. 4...	Nantung	do.				50,000				
do. do. 5...	Shukao	do.				25,000				
do. do. 6...	Tungtai	do.				25,000				
do. do. 7...	Yencheng	do.				25,000				
do. do. 8...	Nantung	do.				23,000	400			
Shun Hsing Cotton Mill 3 ...	Wusih	do.		Yung Tsung Ching	$ 2,000,000	50,000	500	3,800	94,500	Electric
do. do. 4 ...	Hankow	do.		do. do.	$ 5,000,000	15,000		1,200	31,000	Steam
Pao Zung Cotton Mill 3 ...	Tientsin	do.		Liu Pah Sung	$ 3,000,000	51,072		1,700	70,290	Electric
Ta Tung do. ...	Tsungming	do.		Yao Sih Tan	$ 640,000	10,000		662		Steam
Kiu An Cotton Mfg Co. ...	Nantung	do.		Koo Hong Ken	$ 800,000	10,440				Electric
Nih Ching Cotton Spinning Co.	Wusih	do.		Yang Sung Chung	$ 200,000	13,832		1,200	22,750	
Ching Hsing do.	do.	do.		Tai Loh Ching	$ 1,000,000	30,000		2,558	48,128	
Kwang Ching Cotton Mfg. Co.	do.	do.		Yang Han Hse	$ 1,000,000	22,848	52	2,000	30,000	Steam
Tsing Foong do. ...	do.	do.			$ 800,000	14,800	250			Electric
Yue Kang Cotton Mill ...	do.	do.		Fong Shou Yi	T. 800,000	14,000		900	26,400	Steam
Pao Tung do. ...	Soochow	do.		Liu Pah Sung	T. 100,000	22,568		1,450	41,964	do.
Shun Kee do. ...	Changsuh	do.		Hong Ming Tu	T. 150,000	12,740		1,095	25,000	do.
Tsi Tai do. ...	Taichang	do.		Tsiang Pah Yen	T. 500,000	22,700		1,170	22,660	
Li Yung do. ...	Kiangyin	do.		Chien E Hsiang	T. 720,000	15,000		1,200	20,500	Steam
Changchow do. ...	Changchow	do.		Chien E Ching	$ 1,000,000	20,612		695	14,268	Electric
Ta Lung Cotton Mfg. Co ...	do.	do.		Tsiang Pan Fah	$ 1,000,000	10,000	260	1,300	22,000	Steam
Kwan Hsing Cotton Mill ...	do.	do.		Ko Lien Sung	T. 560,000			300	1,400	do.
Li Ming do. ...	do.	do.								
Fou Chong Cotton Mfg. Co....	Shukao	do		Sha Yuen Ping	$ 1,500,000	15,000	200			
Hwa Hsing do. ...	Tientsin	do.	1918	Yang Cha Yun	$ 2,700,000	30,000		1,200	60,000	Electric
Hwa Hsing do. ...	Tsingtao	do.		Chow Tsih Tse	$ 2,700,000	32,000		3,000	105,000	Steam
do. do. ...	Tangshan	do.		Li Hsi Ming	$ 2,200,000	24,000		800	22,000	Electric
do. do. ...	Weihaiwei	do.			$ 2,800,000	22,000		1,000	28,000	do.
Yue Yuen Cotton Mfg. Co. ...	Tientsin	do.	1918	Wong Tsoh San	$ 5,100,000	50,680	500	4,200	157,500	do.
Heng Yuen do. ...	do.	do.	1914	Tsao Chien Ting	$ 5,000,000	42,500	300	2,500	87,000	Electric & Steam
Pei Yang Cotton Mill... ...	do.	do.	1921	Wong Sien Chen	$ 2,000,000	25,000		1,300	62,000	do.
Yue Ta do.	do.	do.	1922	Chen Hwai Sung	$ 3,000,000	35,000		660	44,520	do.
Hsing Chih do.	Wutui	do.		Lu Chun Hwa	$ 150,000	19,480		110	4,500	
Ta Hsing do.	Shichiachuan	do.		Chang Ying Fu		20,000				
Tsoo Hsing do.	Wuchang	do.		Zee Yung Ting	$ 780,000	90,000	700	5,100	12,000	Steam
Hankow Dee Yi Cotton Mill...	do.	do.		T. Y. Li	$ 3,000,000	83,592	1,200	3,500	44,419	do.
Yue Hwa do. ...	do.	do.		Sung Tse Tang	T.1,560,000	40,000	300	1,100		do.
Ching Kuan do. ...	do.	do.		Liu Tse Ching	T.1,000,000	20,736				
Kwan Yih do. ...	Anyang	do.		Yuan Shao Ming	$ 1,500,000	38,592		1,800	50,000	
Yue Foong do. ...	Chengchow	do.		H. Y. Moh	T.2,000,000	50,000	200	3,900	85,200	Electric
Chen Hsing do. ...	Paoti	do.		Lu Lien Cheng	$ 2,500,000	3,000		230	2,450	Steam
Ting Hsing do. ...	Hangchow	do.		Kao Yi Tsung	$ 400,000	18,864	375	1,830	38,500	Electric & Steam
Ho Foong do. ...	Ningpo	do.		Koo Yuen Sung	$ 900,000	23,200		2,500	86,400	do.
Tung Wei Kung do. ...	Siaoshan	do.		Liu Chin Hwei	$ 450,000	14,560		738	24,000	do.
Lu Foong do. ...	Tsinan	do.	1918	Pan Tsing Hong	$ 1,200,000	27,376		1,634	39,000	do.
Yue Chung do. ...	Wuhu	do.		Chen See Fu	$ 800,000	10,000		1,000	43,200	do.
Hwa Shih do. ...	Changsha	do.		H. C. Pang		40,000		2,260	84,516	
Ching Hwa do. ...	Yuts	do.		Liu Shiu Tang	$ 1,500,000	25,000				Steam
Fengtien do. ...	Mukden	do.		Sung Tsoo Chong	$ 4,000,000	20,000	200			Electric
Kiu Hsing do. ...	Kiukiang	do.		Dao Hsing Shu	T.1,000,000	15,360	300			do.
Hsing Nih do. ...	Canton	do.				10,000				
Total Chinese-owned Mills in	Outports		54			1,475,932	6,357			
do. do. do.	China		80			2,304,678	20,745			
do. British do.	do.		5			260,924	2,840			
do. Japanese do.	do.		35			1,070,750	3,964			
do. Cotton Mills do.	do.		120			3,550,108	27,514			

It is apparent, from the above list, that the prosperity of cotton manufacturing industry in China, is not due entirely to the efforts of the Chinese. Out of 120 mills with 3,550,108 spindles and 27,514 looms, only 80 are entirely owned and managed by the Chinese with 2,221,486 spindles and 20,745 looms. The rest being five of British interests with 257,866 spindles and 2,800 looms; 35 of Japanese interests with 1,070,756 spindles and 3,969 looms. In Shanghai the number of mills, spindles and looms owned and managed by the Chinese and Japanese is practically the same. Competition between the Chinese and Japanese is therefore very keen. In 1918 Japan had but 294,000 spindles, but in 1921 the number of spindles had increased to 867,000. Furthermore, the Japanese are constantly investing in the cotton industry in the name of the Chinese.

The following table shows very well the position of foreign mills in China :—

Name	Site	Nationality	Agents	Estab.	Capital	Spindles	Looms
Ewo No. 1 ...	S'hai	Brit.	Jardines	1895		73,952	
,, ,, 2 ...	,,	,,		1914	T. 6,000,000	56,532	1,900
,, ,, 3 ...	,,	,,		1910		25,576	
Oriental ...	,,	,,	Arnhold	1895	1,500,000	54,768	440
Laou Kung Mow	,,	,,		,,	800,000	50,096	500
Total of British Mills (5) in Shanghai					8,300,000	260,924	2,840
Shanghai 1 ...	S'hai	Jap.		1908		20,392	376
,, 2 ...	,,	,,		,,	Y. 4,000,000	25,480	510
,, 3 ...	,,	,,		,,		50,592	
1 ...	,,	,,		1895			
2 ...	,,	,,			Y.10,000,000	83,056	500
3 ...	,,	,,					
Naigai Wata3...	,,	,,		1911		23,040	
,, ,, 4...	,,	,,		1913		41,536	
,, ,, 5...	,,	,,		1915		65,420	
,, ,, 7...	,,	,,		—			600
,, ,, 8...	,,	,,		—		20,416	
,, ,, 9...	,,	,,		—		26,936	1,000
,, ,, 12...	,,	,,		—		20,800	
,, ,, 13...	,,	,,		—		24,000	
,, ,, 14...	,,	,,		—		24,000	
1...	,,	,,				30,720	
2...	,,	,,				15,312	
	,,	,,				58,240	
	,,	,,				40,704	
	,,	,,				27,372	
1...	,,	,,			$9,000,000	10,000	
2...	,,	,,				15,360	
3...	,,	,,				20,000	
	,,	,,				50,000	
Total of Japanese Mills (24) in Shanghai						693,376	2,968

The above table does not include the Japanese mills in other parts of China, such as Tsingtao and Mukden, where eleven mills are either already established, or still under construction.

The table also shows how the British interests took the lead at first and then later it was taken over by the Japanese. It is reported that Japanese are also planning mills in other places.

The marked success of the well-managed foreign mills in Shanghai and the extent to which they have increased their producing capacity in the past few years are ample proof of the fact that China offers a splendid field for the development of the cotton manufacturing industry.

The fact that Kiangsu is the leading cotton manufacturing province is simply because in it exists Shanghai, the principal cotton manufacturing centre in China. The rapidity with which the industry has developed in Shanghai is indicated by the statistics of the cotton yarn and piece goods manufactured in local mills exported from the port through customs (native and maritime) to other parts of China and foreign countries during the years 1899 to 1918 :—

Year	Yarn (in pounds) Maritime Customs	Yarn (in pounds) Native Customs	Piece Goods (in Hk. Tls.)
1899	35,588,266		48,400
1900	28,192,933		29,360
1901	28,019,466		23,460
1902	24,529,866		35,095
1903	13,327,466		31,840
1904	18,896,800		89,026
1905	18,560,933		70,980
1906	11,361,466	18,810,400	29,940
1907	24,852,800	4,191,200	86,304
1908	46,798,533	6,263,066	214,496
1909	51,003,600	3,946,133	330,251
1910	36,490,533	6,668,400	249,538
1911	45,657,866	7,522,266	462,211
1912	64,775,733	11,512,000	889,030
Year	Yarn (in pounds) Maritime Customs	Yarn (in pounds) Native Customs	Piece Goods (in Hk. Tls.)
1913	59,746,000	8,135,066	600,477
1914	88,302,266	3,618,666	743,745
1915	99,815,067	2,986,800	1,057,577
1916	102,253,467	3,302,800	1,321,455
1917	124,071,600	2,636,933	1,586,380
1918	134,481,733	3,681,200	1,717,957

The following is a list showing the number of Chinese-owned mills in different provinces (up to January 1922) :—

Province	Mills	Spindles	Looms	Hands	Cotton Consumption	Yarn Production
Kiangsu ...	48	1,337,882	9,124	67,707	1,975,443	560,836
Chihli	9	308,552	800	12,470	507,810	144,510
Hupeh ...	5	249,328	1,500	10,900	195,419	45,659
Honan ...	4	113,000	200	6,930	165,650	47,920
Chekiang ...	3	56,624	375	5,158	148,900	40,000
Shantung ...	2	58,000		4,634	144,000	40,000
Anhwei ...	1	10,000		1,000	43,200	10,800
Hunan... ...	1	40,000		2,260	84,516	25,488
Kiangsi ...	1	15,360	300			
Shansi ...	1	12,880				
Fengtien ...	1	20,000	200			
Kwangtung ...	1	10,000				
Total	77	2,237,486	12,459			

The above list indicates that Kiangsu is leading in the cotton manufacturing industry with Chihli in second place and followed by Hupeh, Chekiang, Honan, Shantung, etc., while Anhwei, Hunan, Kwangtung and Fengtien are still in the infant stage.

It may not be out of place to mention some principal factors that have contributed to the establishment and growth of the cotton manufacturing industry in Shanghai. It is true that Shanghai is a treaty port where foreigners are permitted to engage in manufacturing industries which make it an outstanding figure, still there are other factors why Shanghai is capable of developing into a leading industrial centre, viz.: (1) Shanghai and its vicinity such as Taichang, Changshuh, Nantung, etc., are the most prosperous cotton-producing section, with a supply of sufficiently good quality for spinning low counts yarn. The cotton supply is very accessible for transportation to the mills in Shanghai; (2) China ranks first and second in the world's consumption of yarn and cotton cloth respectively. Shanghai is the principal port where foreign goods enter: it is natural for Shanghai to establish mills, where products can be easily distributed; (3) Shanghai's abundant supply of both Chinese and Japanese coal and the usually low rate charged for electric power make the mills in Shanghai lower in first cost and running expenses; (4) Shanghai has better financial facilities than any other part of China and an abundance of very cheap labor; (5) Shanghai is the starting place of modern mills and it is natural to have more mills in Shanghai where mills can be better equipped with hands and experts.

V. Machinery Used in Chinese Cotton Industry

The modern cotton spinning and weaving industry started in the British empire, where cotton machinery was first invented. Naturally, the British are leading the rest of the world in supplying the bulk of cotton machinery used in China. Recently, however, with the return of American-trained students, American-made machinery is coming in very rapidly.

BRITISH MAKE—Asa Lees 287,916 spindles; Howard and Bullough 216,148 spindles; Dobson and Barlow 212,792 spindles; Brooks and Doxey 191,308 spindles; J. Hetherington 189,564 spindles; Platt 28,118 spindles; Tweedales Smalley 14,560 spindles; manufacturers unknown 40,000 spindles; Total 1,190,406 spindles.

AMERICAN MAKE—Saco-Lowell 614,820 spindles; Whitin 36,836 spindles; Woon socket 35,000 spindles; Moson 5,000 spindles; manufacturers unknown 10,440 spindles: Total 722,096 spindles; other makes: Total 164,080 spindles. Total cotton spindles in China 2,066,582 spindles.

VI. Future of Chinese Cotton Manufacturing Industry

A country with multitudes of people dependent largely upon cotton, both in its raw and weaved state, as a material for clothing and in many sections where climate is sufficiently mild throughout the greater part of the year to permit the general use of cotton cloth, China certainly has a very bright future in cotton manufacturing industry. The following table shows the yarn consumption in China during the last decade (1912-1921) :—

Year	Yarn manufactured in China	Yarn imported	Per cent. of import	Total Consumption
1912 ...	800,000	2,300,000	74	3,100,000
1913 ...	1,200,000	2,700,000	70	3,900,000
1914 ...	1,600,000	2,500,000	60	4,100,000
1915 ...	1,600,000	2,600,000	61	4,200,000
1916 ...	2,500,000	2,400,000	50	4,900,000
1917 ...	2,600,000	2,000,000	43	4,600,000
1918 ...	2,700,000	1,100,000	29	3,800,000
1919 ...	3,300,000	1,400,000	30	4,700,000
1920 ...	4,000,000	1,300,000	25	5,300,000
1921 ...	4,500,000	1,200,000	21	5,700,000

It is apparent from the above table that although cotton yarn manufactured in China has increased five or six times, yet the import of yarn still has 1,200,000 piculs as the lowest figure. There is no doubt for the great possibilities to develop the cotton manufacturing industry into bigger scale. The great possibilities of the cotton industry in China can also be shown by the fact that with a population of 45,000,000 in Great Britain, there are 57,000,000 spindles in operation. The population of China is ten times that of the British Empire, yet there is a spindleage of but one-seventeenth to that of the British Empire. The *per capita* spindles in China is only one to every 200 people, while in the British Empire there are 250 to every 200 people. Moreover, the British people wearing more woollen, while the Chinese are almost entirely dependent upon cotton fabrics.

Country	Population	Spindles	Per capita
China	400,000,000	1,500,000	266
Germany ...	65,000,000	11,750,000	58
France	40,000,000	7,300,000	56
India	315,000,000	6,875,000	56
U.S.A.	92,000,000	33,800,000	27
Japan	50,000,000	3,100,000	16
Great Britain ...	45,407,000	57,000,000	8
Canada	7,250,000	10,000,000	7
Italy	35,000,000	5,000,000	7
Spain	20,000,000	3,300,000	6

China has now more than 30 years' experience in the cotton manufacturing industry. It is, therefore, for the Chinese to enter into the field with more energy in order to facilitate more progress. The following are the necessary steps to be taken for the development of the modern cotton manufacturing industry in China:—

1. *Development of Cotton Cultivation.*—Cotton is the only raw material required in this industry. With the recent development in cotton mills, the demand of cotton is already over its supply. Much cotton has been imported into China during the last few years. In 1922, because of the flood in Kiangsu and military destruction in Shensi, the production of both provinces was reduced considerably. In 1918 the import of raw cotton from abroad was only 180,000 piculs, while in 1922 the figure increased to 1,680,000 piculs, the increase being nine times, which is comprised one-third of American and two-thirds of Indian cotton. China is primarily an agricultural country with an annual export of a large quantity of raw cotton. Since the operation of the cotton mills, with 2,000,000 spindles, large amounts of raw cotton are already required from abroad; then there will be a still further shortage if the industry is to be properly developed. It is clear enough that more attention is needed in cotton cultivation. Seed selection, improved cultivation, extension of cotton fields and the establishment of various organizations and a few essential steps are to be taken.

2. *The Training of Experts.*—The success of an industry depends much on the expert knowledge. Since the cotton manufacturing industry is a very highly specialized one, it needs more expert management and supervision. It is urgently needed to have a great number of persons well trained for these positions in the cotton mills. The establishment of a technical school for this purpose is urgently needed to work toward this end.

3. *Better Treatment of Employees.*—According to the principle of economics, land, labor and capital are the three essential things in any industry. It is plain enough that labor plays an essential part in the industry. In order to relieve future labor uneasiness in China, precautious steps have to be taken. Ways and means have to be devised for the better treatment of laborers. An intelligent and efficient labor force will add much to the prosperity of the industry.

4. *Better Management of Mills.*—A well managed mill is apt to achieve great success. It is essential for the managing staff to study the improvement of production in order to bring down the cost. Definite steps in reserving more funds for strengthening the foundation of the mills are not to be overlooked.

5. The need of organizations for mutual benefit and improvement. The work and service rendered by the Chinese mill owners' association is self-evident. It is hoped that more of such organization will be started to work from different angles to bring together the result as a whole for the development of the Chinese cotton manufacturing industry.

PRAI WATER SUPPLY

(Continued from page 597).

Design, Etc.

The works are being constructed for the F.M.S. railway administration, and are being carried out departmentally by the construction department under the chief resident engineer.

Messrs. Coode, Matthews, Fitzmaurice and Wilson, consulting engineers, designed the works which are being supervised locally by their chief superintendent engineer.

The original location and survey of the reservoir site was made by Mr. H. S. Smail, irrigation engineer, of the P. W. D.

The pipe line was located and surveyed by Mr. John Leggate of the construction department.

Mr. A. T. O'Kelly was in charge of the works until July last, when the author took charge.

In conclusion the author expresses his thanks to Mr. James Brown, chief superintendent engineer of Messrs. Coode, Matthews, Fitzmaurice and Wilson, for the assistance he has given—which includes most of the figures given in this paper.

Also to the Chief Resident Engineer, Mr. F. D. B. Openshaw, for permission to read this paper, for placing departmental papers and records at author's service, and for his assistance in other directions.

Appendix

Institute for Medical Research,
Kuala Lumpur, F.M.S.,
14th April, 1919.

Examination of a sample of water from Bukit Serayah—proposed supply for Prai—received on 1.4.1919.

The sample was contained in two Winchester quart glass bottles labelled "Sample from stream just above site of proposed dam at Bukit Serayah, and about one mile below source, Bukit Mertajam hills. Collected 27.3.1919."

RESULTS OF CHEMICAL AND PHYSICAL EXAMINATION.

Colour—very slightly brownish.
Turbidity—slightly turbid.
Other suspended matter—a little brown.
Reaction—very slightly alkaline.

	parts per 100,000
Free ammonia	0.0012
Albuminoid ammonia	0.0064
Oxygen absorbed in 3 hrs.	0.0490
Chlorine ...	0.20

Nitrates—slight trace.
Nitrites—nil.

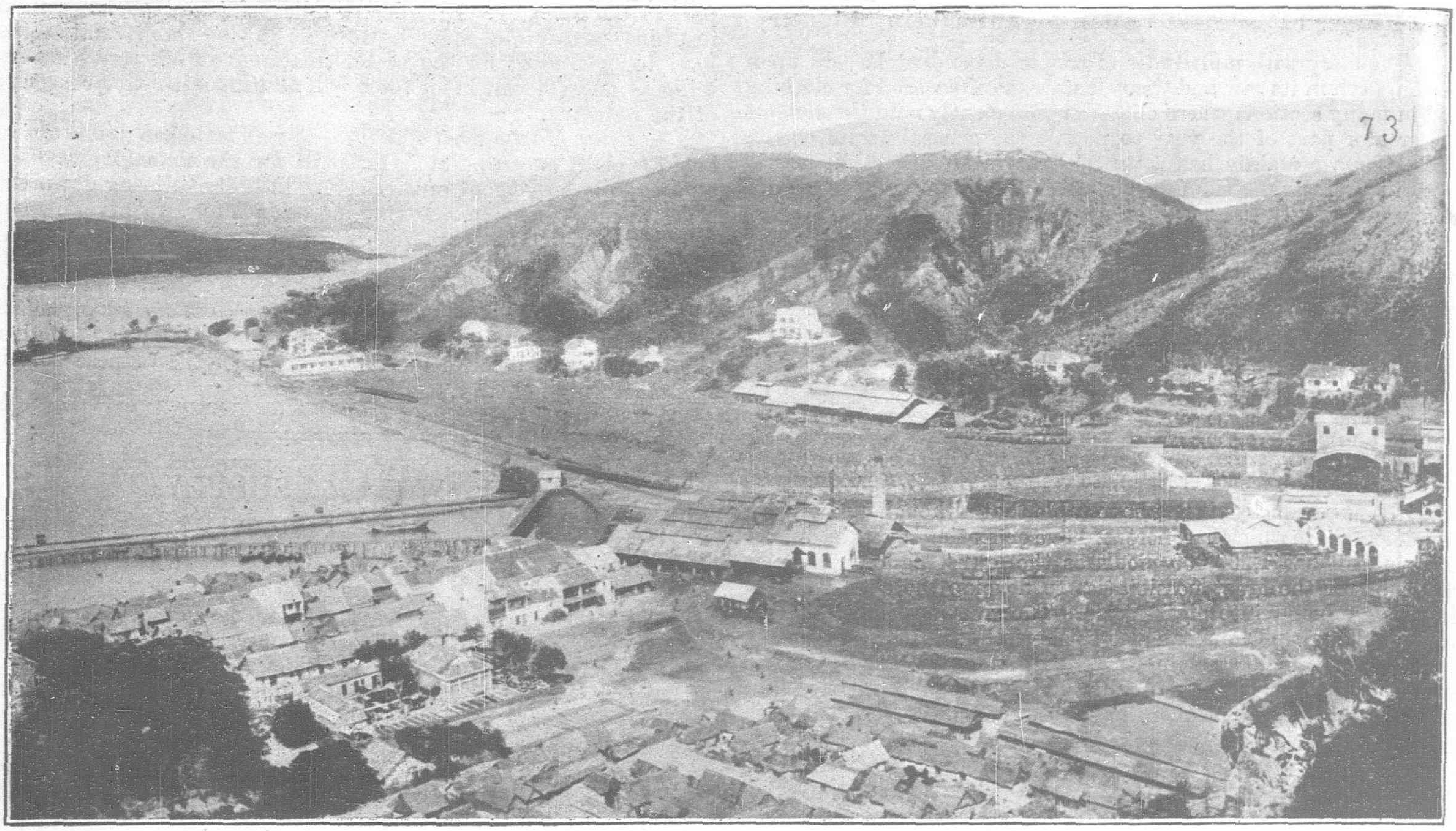
Total solids	6.05
Hardness, permanent	1.95

"Temporary"—nil.

REMARKS.—The water is one of considerable organic purity and the analysis does not disclose any reason why the water should not be suitable for domestic use.

The very low total solids should render the water suitable for industrial use.

(Sd.) H. MARSDEN,
Ag. Government Chemist.



General View of the Hongay Coal Mines

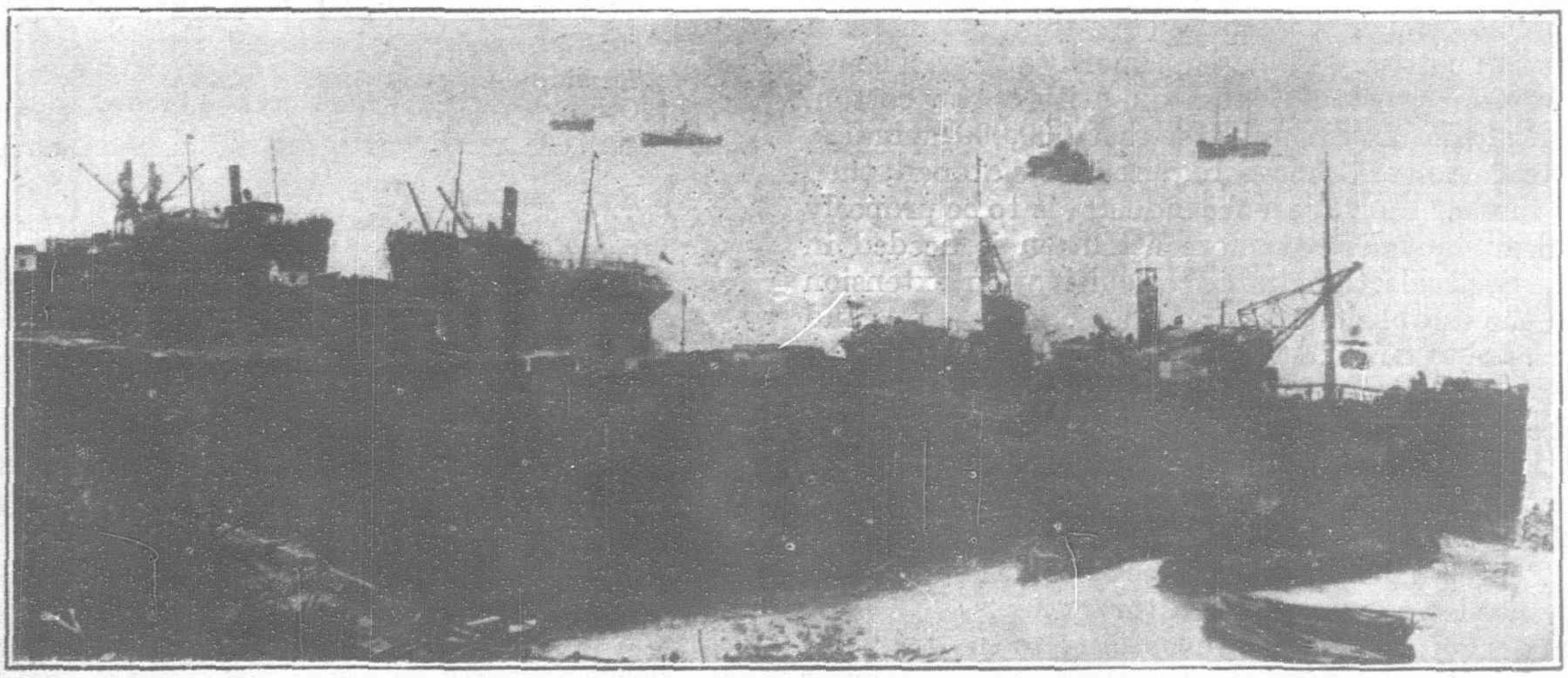
The Mines of Indo-China

Written by the Mines Department of the Indo-Chinese Government

Development of Mining.

FROM the curve showing the development of mining in Indo-China during the last fifteen years, it will be seen that the output of the collieries has, almost always, been on the rise. At the present time trade is flourishing and the demand exceeds the means of supply, so that we may expect the owners will make a special effort to increase this output.

On the other hand the other mines are passing through a serious crisis due to the abnormal after-war economic conditions. No doubt better days are ahead as soon as increasing and less erratic business calls for increased supplies of metals.



Port of the Hongay Coal Mines

Of the five countries of the Union, Tonkin has been the most fully explored and appears to be the richest in mineral wealth. Minerals have been discovered in Annam and Laos, but nothing serious can be done until the means of communication have been further developed, thus permitting of real prospecting and a more facile opening up of mines in districts already known to contain deposits.

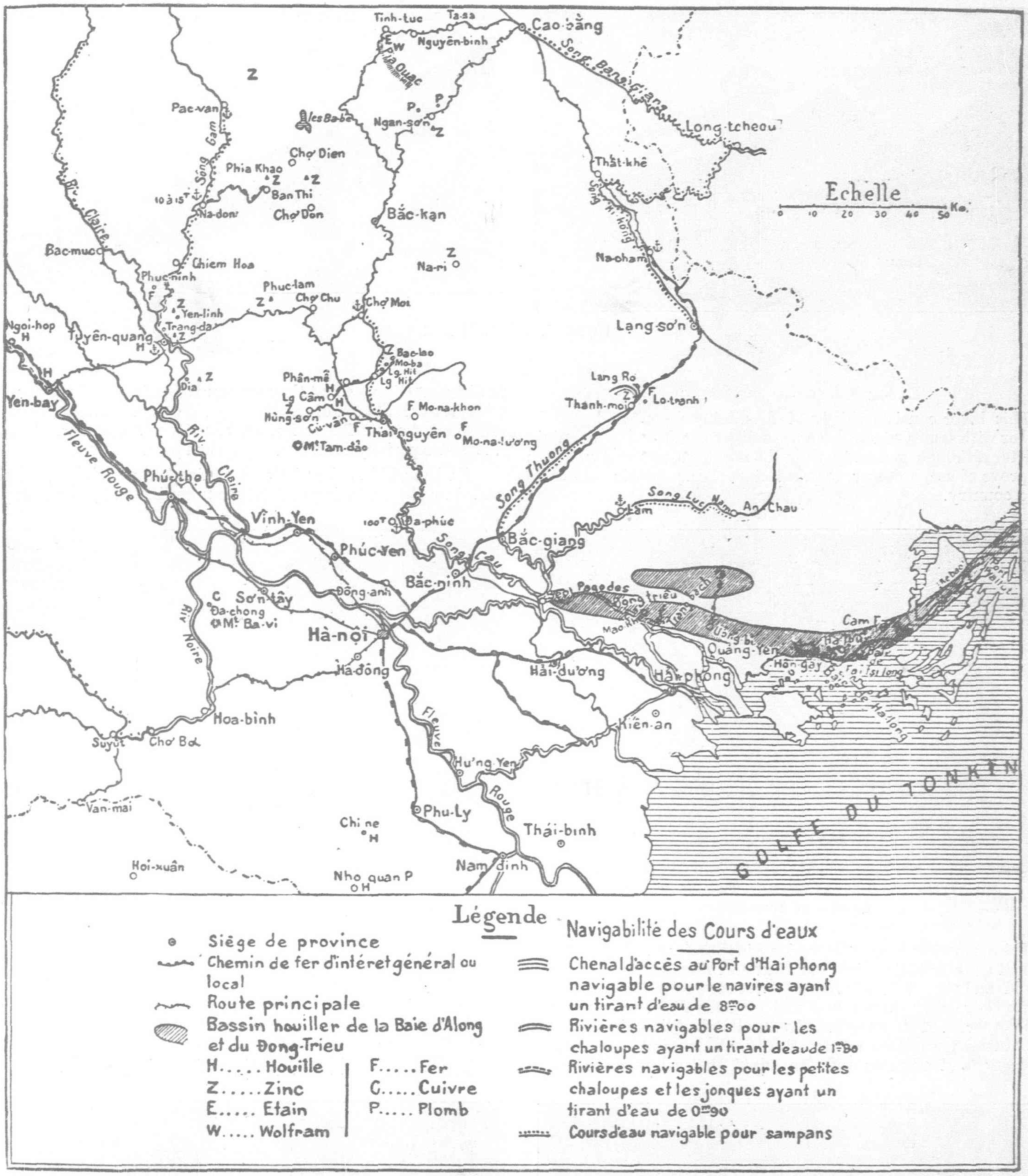
Both Cambodia and Cochin-China being composed largely of lowlands are not likely to have much mineral wealth, though a few interesting mines are to be found in the former country.

Mining Legislation.

The basis of the present regulation is the decree of 26th January, 1912, modified by the decrees of 24th December, 1913 and 12th November, 1916, which decree is founded on the principle of the mine belonging to the finder.

Instead of employing the usual French method of royalties and all that it implies it was considered better, in view of the difficulties of the situation, to reserve to the prospector the deposit that he discovered.

The right to prospect within certain defined limits is acquired by the first comer after the payment of low fees and without it being



Principal Mineral Deposits of Tonkin

necessary to prove beforehand that deposits actually exist there. The explorer is thus put into sole possession for three years of the right of prospecting within a square having sides of 3 km. (1.86 mile) parallel with the lines of longitude and latitude, and the centre of which is officially marked by a post.

He has the right of changing this temporary occupation of the land into a permanent concession provided that he applies for this within three years and pays a fixed and very moderate fee.

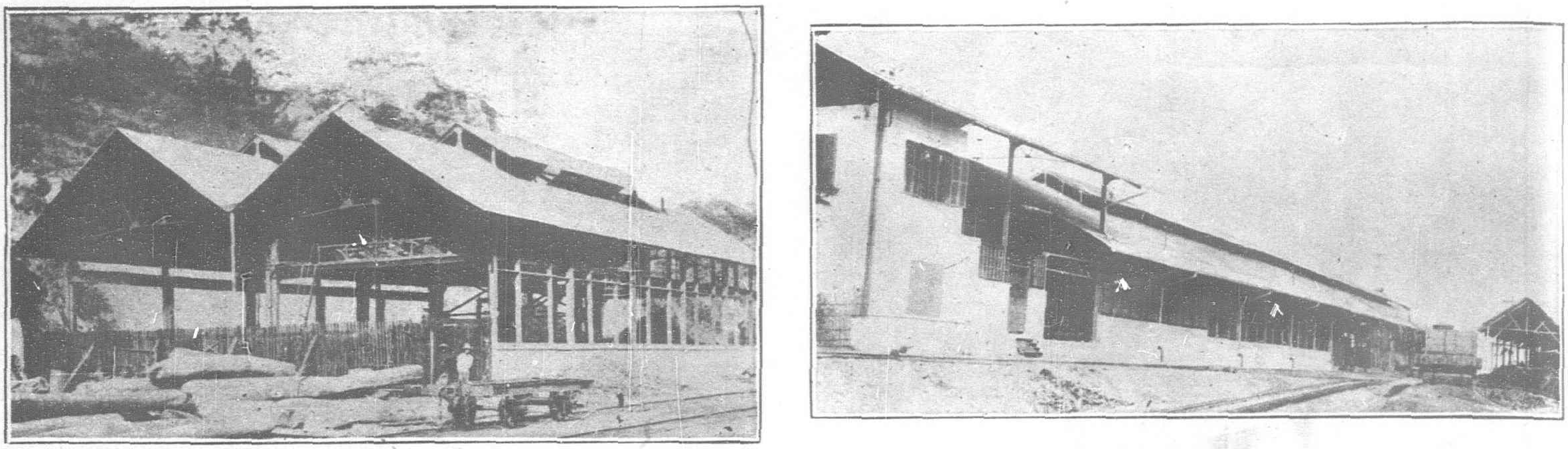
This is the normal method of obtaining concessions, but to prevent monopolies the authorities have the right to create reserved districts in which the concessions are let by public auction. Two of such reserves are already to be found in the Dong-Trieu coalfield, and the Thai-Nguyen mining district.

The holder of a concession has to pay a yearly fee of gradually increasing value during the first ten years, after which it becomes uniform.

It may be mentioned that according to the decree of 28th July, 1918 all demands for the right of prospecting or mining must be accompanied by a personal authorization signed by the local authorities.

PROSPECTING.

The variations in the number permits granted annually for prospecting is shown by the government reports in recent years the prospecting has been specially for fuel, metalliferous mines being neglected owing to the bad times.



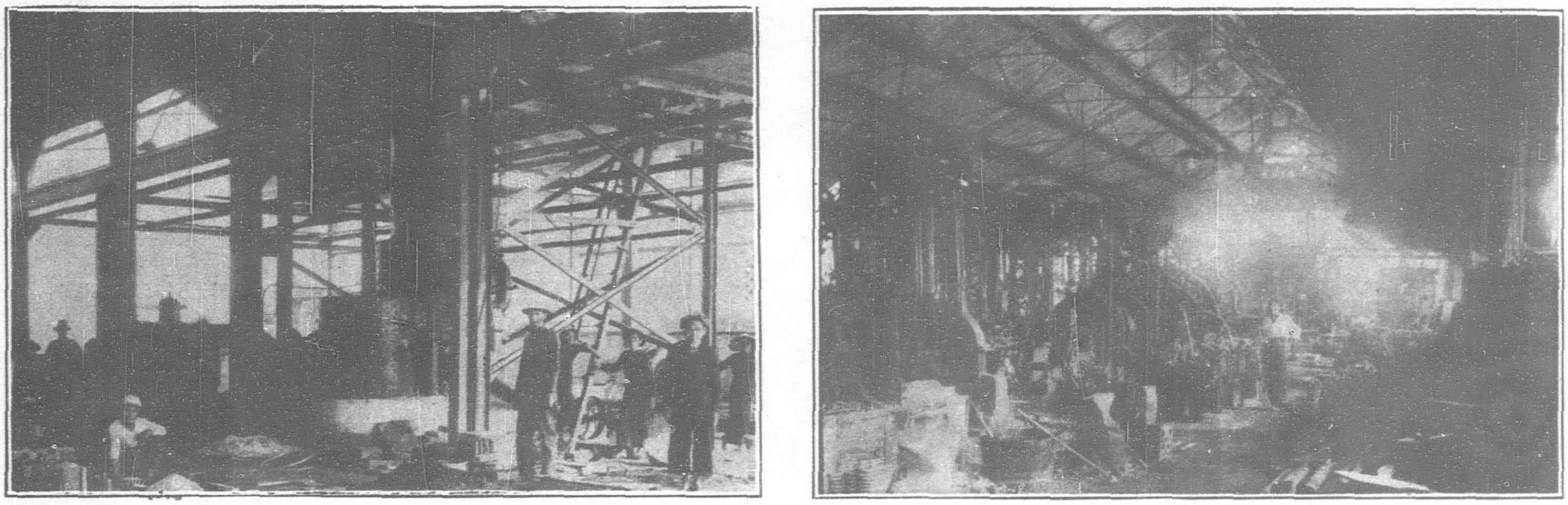
HONGAY COAL MINES

New Foundry

Machine Shop

LABOR EMPLOYED IN MINING.

This labor consists chiefly of Annamites from the lowlands, together with some Chinese. Some coolies come from the mountain districts, although generally they do not take to regular work; they prove of use, however, to prospectors owing to their knowledge of the country.



HONGAY COAL MINES

Interior of Foundry

Interior of Machine Shop

The Annamites do not like working in the mines as they are much attached to their native rice-fields and find the climate of the hills too cold, and they do not leave the lowlands except through necessity, for they easily catch fevers and are generally not very robust. On the other hand they are intelligent, skilful, and easily managed.

Chinamen, who have no such objection to leaving their country, are bigger, and stronger and can adapt themselves more easily to different climates, but they are more exacting* and not so reliable while they do not readily accept the necessary restraints of work and are fond of collective action against the management. They are adapted especially for all hard physical jobs.

In Indo-China the piastre contains 375 grains Troy of silver, and since the beginning of 1922 the notes issued by the Banque de l'Indochine may be exchanged into piastses at sight, so that they remain practically equal to the value of silver. At the present time

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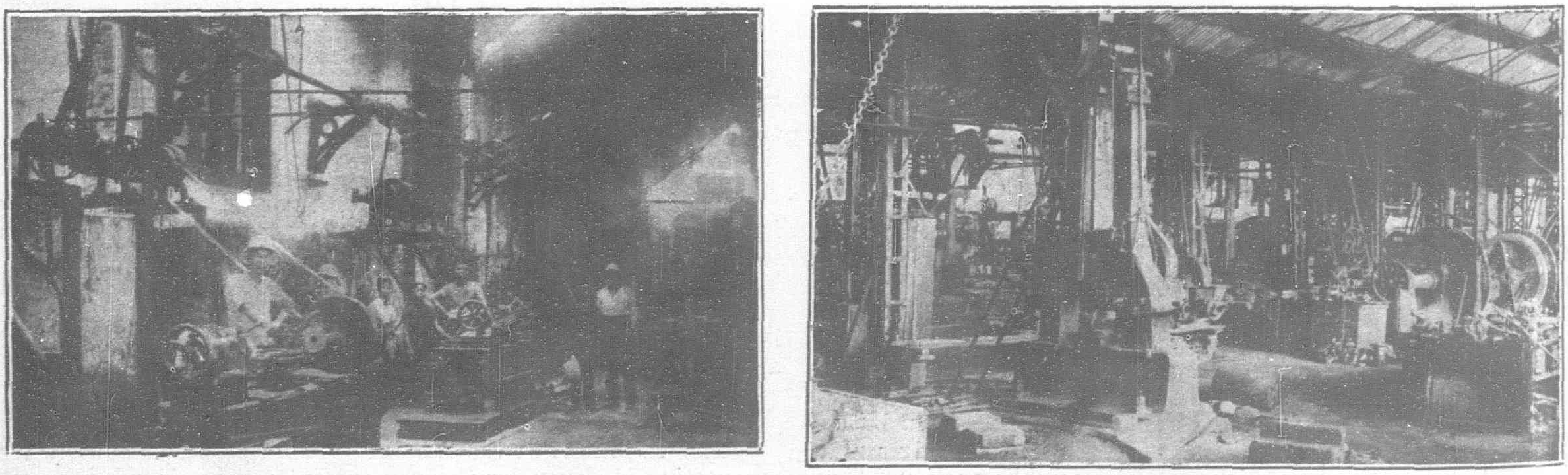
*The average wages are :

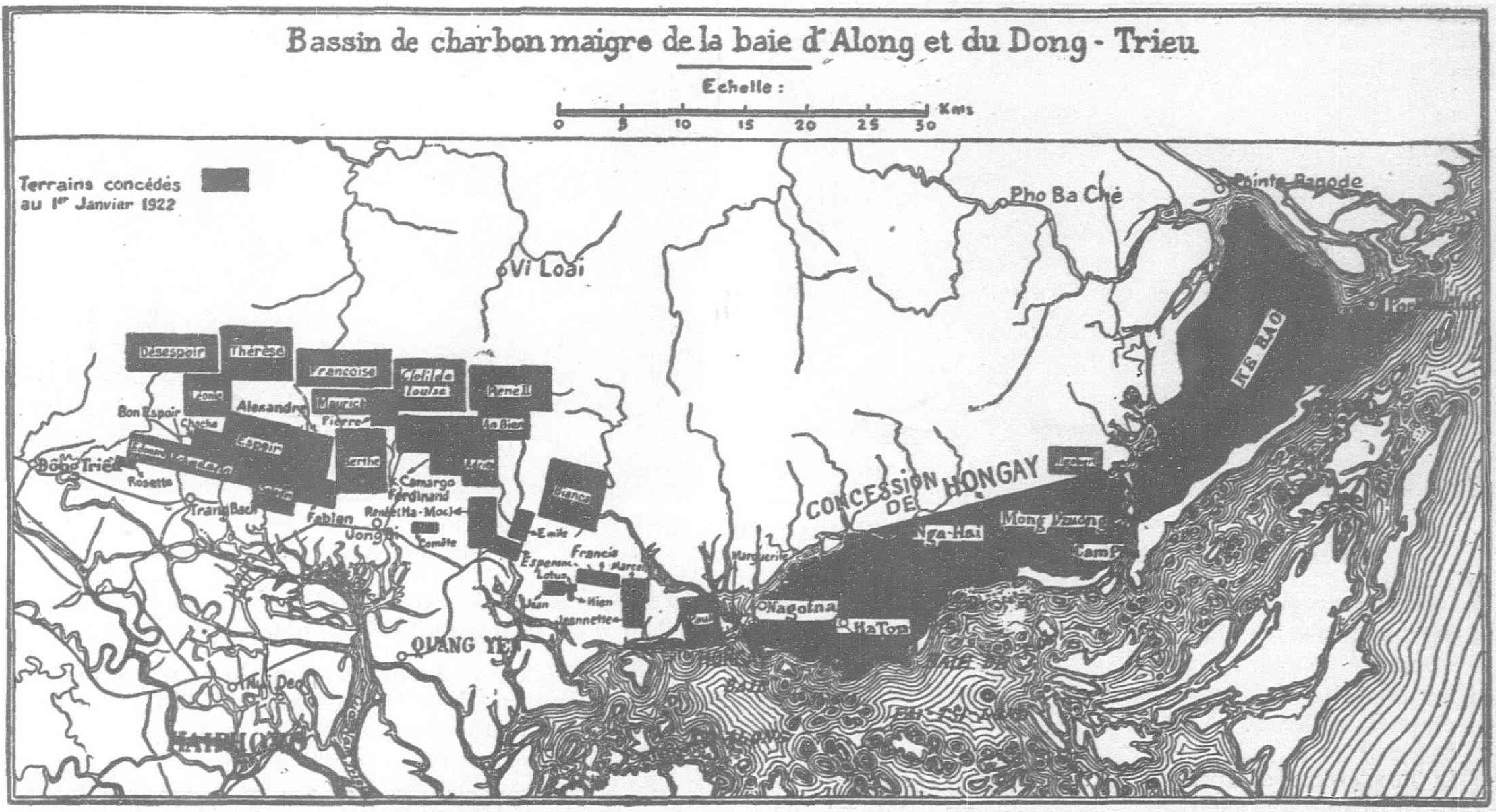
Chinaman	.50	piastres per day
Annamite	.35	— —
Native woman	.27	— —



HONGAY COAL MINES

Machine Shop—Lathe Room

Machine Shop



Non-Bituminous Coal Field of Along Bay and Dong Trieu

the piastre is worth a little more than half a dollar in gold, that is to say but slightly different from its pre-war value.

The recruiting of labor and its retention near the mines is a problem of the highest importance, but Tonkin with its 7,000,000 inhabitants, packed, especially in the delta of the Red River, to the extent of 1,300 to 1,550 to the square mile, happily forms a handy reservoir of labor. The gradual penetration of the Annamite population into the mountain districts, where trade centres are being formed and where the increased means of communication enable the home-sick native to more easily pay his periodic visit to his old home, is tending to improve the recruiting of this labor, so that if the various companies and private owners do all they can to improve the lot of their work-people, the problem will soon be successfully solved.

The output of the coolies is small, especially on heavy jobs, but owing to their low rate of pay their labor is still cheaper than that of Europeans. For a long time skilled workers were recruited from among the Chinese, but now-a-days the Annamites are taking their places, as they are very satisfactory when well superintended.

European Staff.

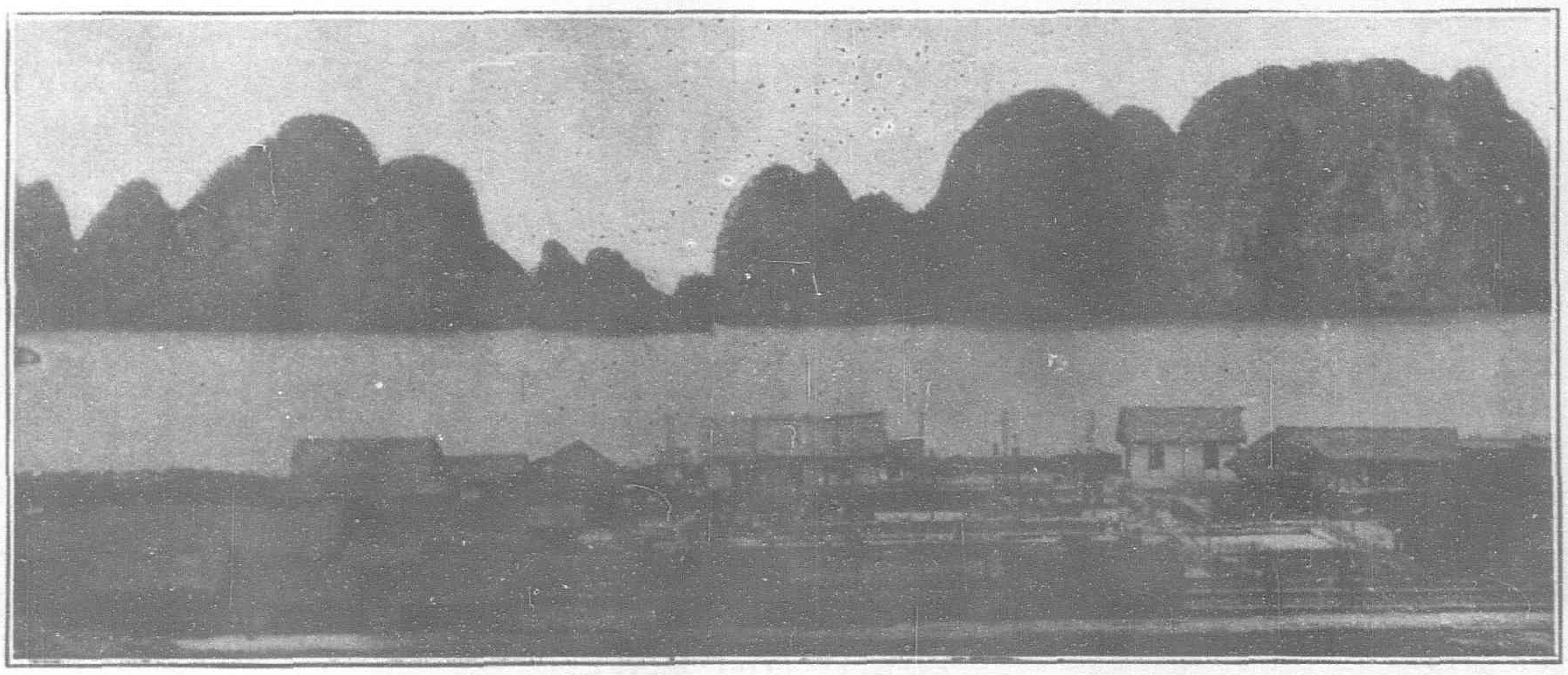
The European managing and administrative staff should be chosen with the greatest of care, especially where the board of directors, as is too often the case, are in France, in which case they should be given the very widest possible powers both in matters of decision and in questions of initiative if serious loss of time and costly mistakes are to be avoided. The salaries of such officials, which average about three times those obtaining in France, should, therefore, be calculated largely.

Yard-masters or works-managers are often chosen from local labor, but their lack of professional education throws a very large amount of extra work and responsibility on the shoulders of the European engineer.

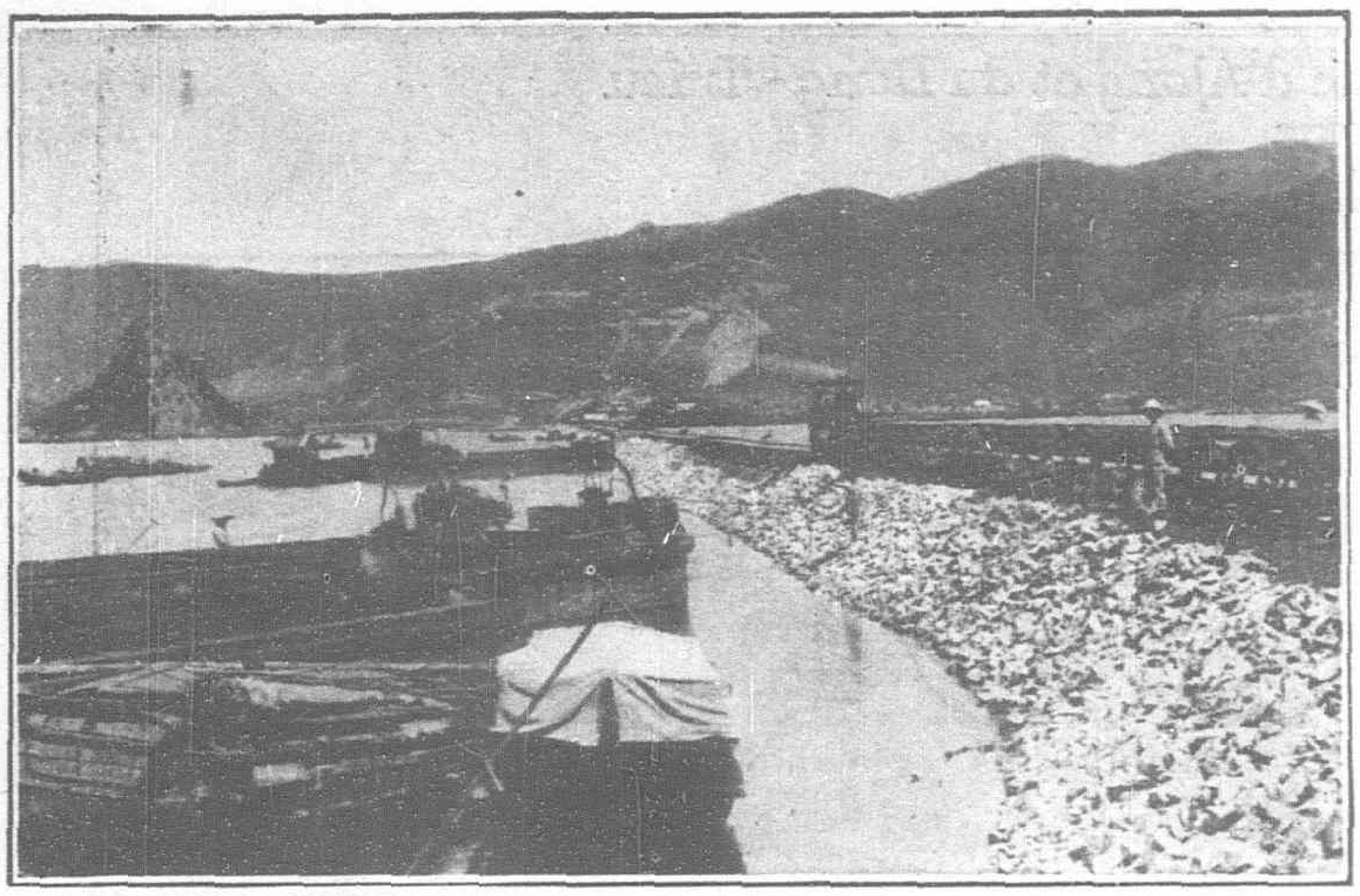
Transportation.

In a new country like Indo-China the question of transportation is as important as that of the richness of the ore. Every mode of transportation is employed according to the country and the value of the product carried, thus in the highlands of Tonkin wolfram and cassiterite (oxide of tin) are packed in 33-lbs. bags and carried on the backs of men or horses to the nearest road and thence on carts to the railway which brings it down to the port of exportation. It would not pay to carry zinc ore, of much less value except in bulk by railway or water.

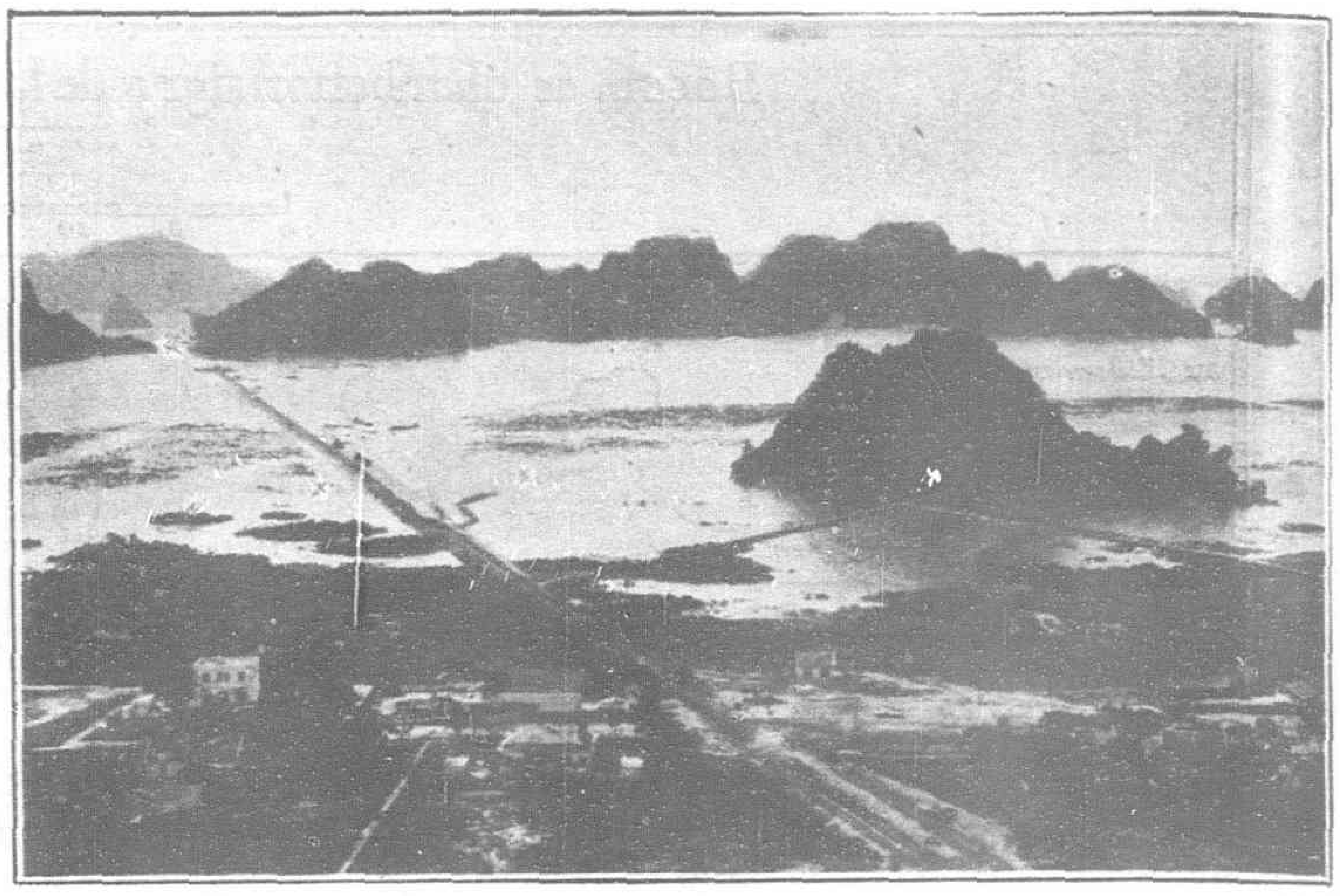
The following figures and prices will enable anyone having a good map of the country showing existing roads, railways and navigable waters, to arrive at some idea of the cost of transportation from any given mine to the sea. A small map of the known ore deposits of Tonkin is given above. It should be noted, of course, that Upper-Tonkin, Upper-Laos and the Annamite mountain chain are exceedingly undulating and where neither railway nor road are marked it would be prudent to reckon on either small packs carried by men or animals or the building of costly roads or railways. On the contrary in the open forests of the Me-kong valley are to be found innumerable cart tracks which can be utilized in the dry season and can easily be extended.



Hongay Mines: Erecting the Central Electrical Plant at Kilometre 5



General View of the Campha Mine



Causeway at the Campha Mine

HONGAY COAL MINES

The cost of transporting one ton (2.240-lbs.) one mile in Tonkin may be taken as about :

		Piastres		
Carried on men's backs	from	.98	to	1.31
— on pack-horses	—	.83	—	1.14
— in small carts	—	.33	—	.49
— in 3 to 5 tonne sampans	—	.114	—	
— in 10 to 15 tonne sampans	—	.05	—	.08
— in 15 to 30 tonne sampans	—	.16	—	.049
— in launches, junks and towed barges of 50 tonne and over	—	.013	—	.01
— by railway, not less than	—	.033		

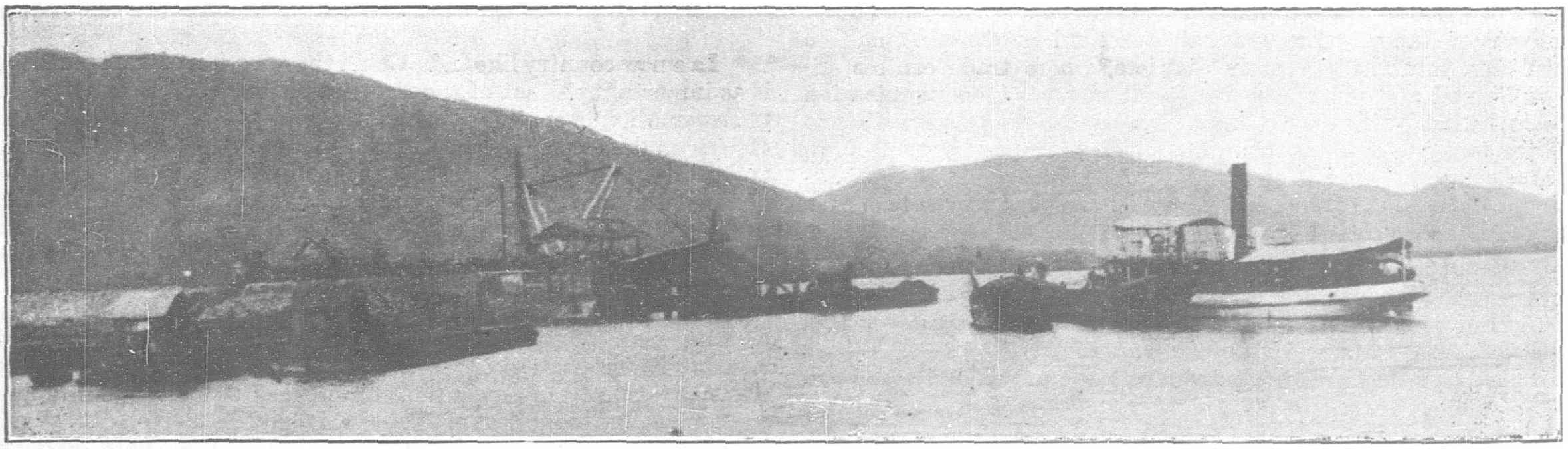
Rates of freight to Europe which were prohibitive during and after the war have recently fallen considerably and at the beginning of 1922 were below the pre-war rate calculated in gold or piastres, but their rapid changes make it impossible to give any figures.

Below will be found some notes on the principal ore deposits of Indo-China, noteworthy either on account of their richness or of some past or present circumstance.

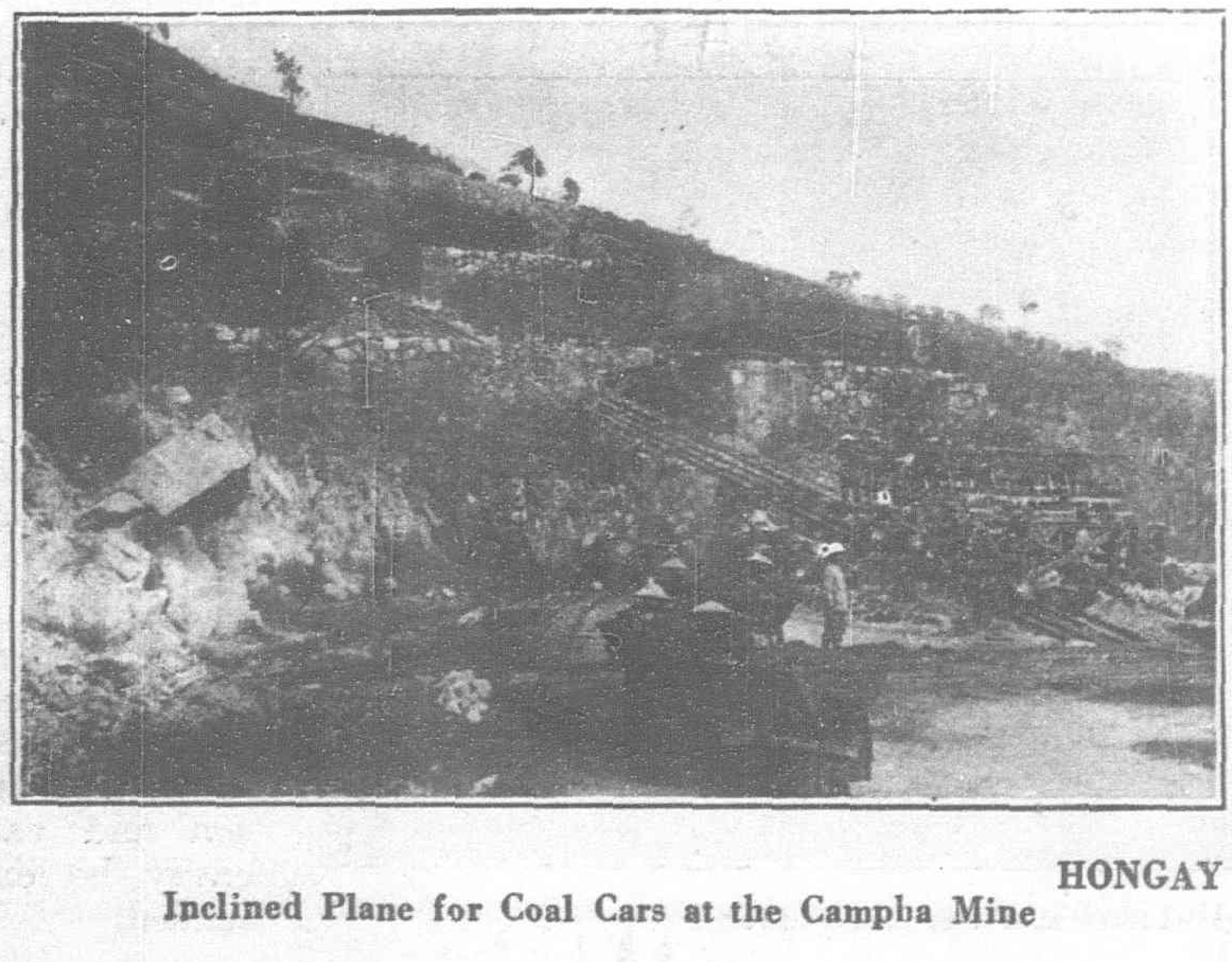
THE MINES OF TONKIN

I.—Coal and Lignite

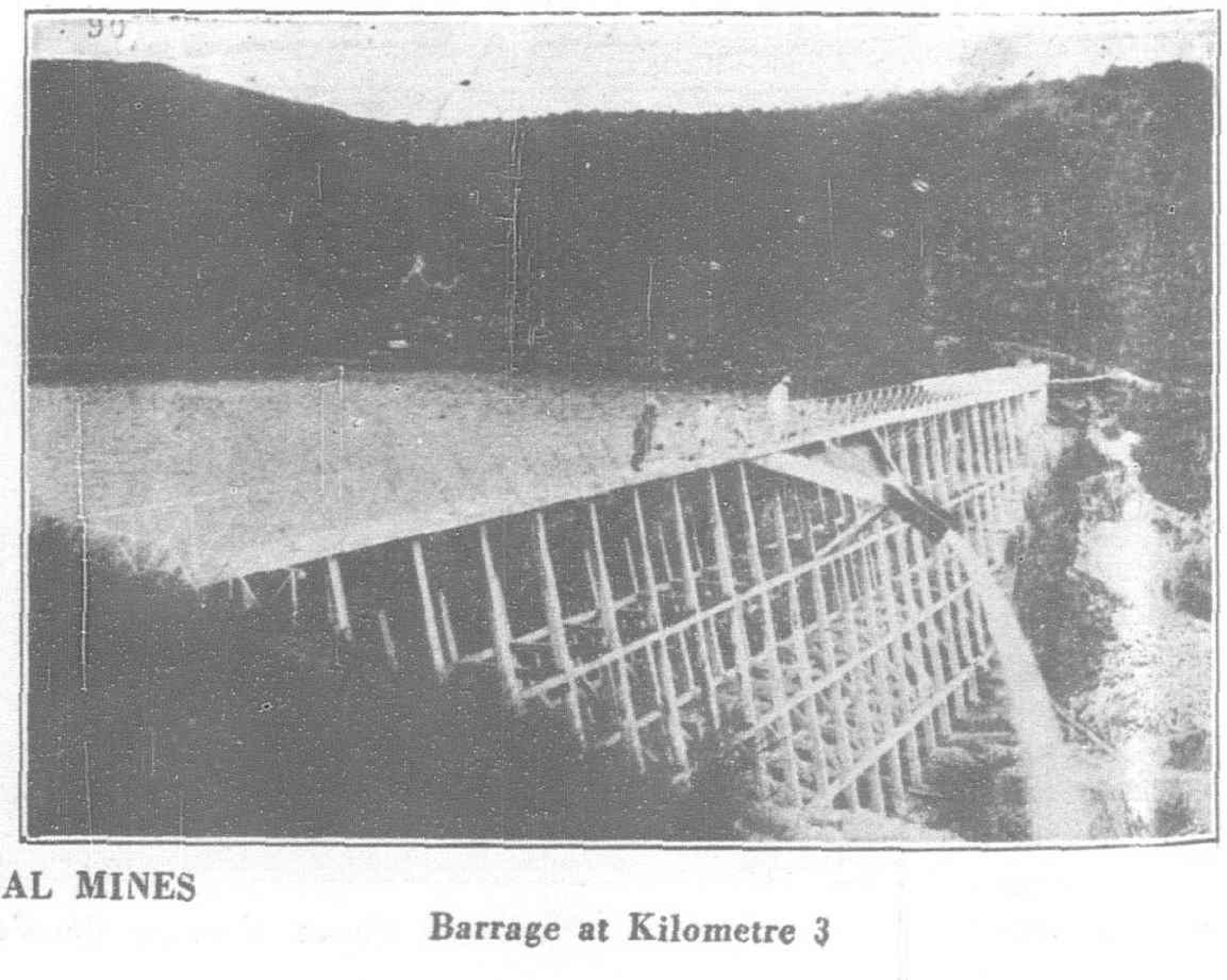
The principal mineral wealth of Tonkin lies in her collieries, of which the attached table shows the exports for 1921.



Coal Loading Device at the Campha Mines



Inclined Plane for Coal Cars at the Campha Mine



Barrage at Kilometre 3

HONGAY COAL MINES

COAL.

The principal coal-field, first worked in 1884, is that lying along the bay of Along and in the Dong-Trieu forming an arc some 112 miles long from near Mon-kai on the east to Seven Pagodas on the west. This coal is non-bituminous and is extracted from strata of the Rhetian secondary period. Its average composition is as follows:

Volatile matter	from 8 to 12 %
Ash	— 2.5 — 7 —
Fixed carbon	— 87 — 88 —
Sulphur	— less than 1 —
Heating value	from 7,000 to 8,400 calories (280,000 to 333,000 B. T. U.)

It is a first-class coal burning without smoke and producing no clinker; with forced draught—such as the Howden system in ships—it can be used alone, even unscreened as at a pinch in fine pieces. When mixed with bituminous coal it forms a good steam coal capable of being burnt in locomotives and ships. Before bituminous coal was discovered in Tonkin it had to be imported from Japan, but the big shipping companies are now beginning to ship the following mixture at Haïphong: 60 per cent. of non-bituminous Hongay coal and 40 per cent. of Tonkinese bituminous coal.

SITUATION OF THE COLLIERIES.

The collieries of Along Bay are privileged as the coal can be won chiefly in open cuts and there are natural deep-water harbors in close proximity where vessels of from 4,000 to 6,000 tons can easily be berthed (Hongay, Port Courbet and Port Wallut).

Coal can be shipped from the Dong-Trieu coal-field in 100-ton barges from the principal mines lying not far from the Song-Da-Bach to Haïphong at an average cost of .80 piastres per ton.

BITUMINOUS AND SEMI-BITUMINOUS COAL.

Two deposits of bituminous or semi-bituminous coal have been recently discovered in Tonkin, belonging to the same geological period as the non-bituminous coal, and though they are by no means so extensive or so accessible as these fields, yet they are of interest to the colony, which has, hitherto, had to be tributary to Japan for this kind of coal.

THE COAL TRADE.

Several markets are open to the coal of Tonkin of which the following table gives the output and the principal destinations:—

Stock on Jan. 1, 1921	Output during 1921	Consumed in the Colony	EXPORTED to Hongkong, Japan, China and other countries in the Far East	Stock on Jan. 1, 1922
175,550t	920,900t	451,061t	525,767t	119,642t

DISTRICTS	Mine	Sort of Coal	Output — Tons	Exports — Tons
Along bay*	Hongay	Non-bituminous	720.000T	497.163T
	Kébao	—	8.311	7.759
Port-Courbet to Dong Trieu	Francis	—	8.580	12.000
	Paul (Vu Oai)	—	600	
	Margot	—	1.800	
	Hien	—	2.126	4.300
	Espérance	—	1.450	
	Renée	—	22.113	
	Clotilde Louise	—	24.857	
	Fabien	—	12.900	
	Espoir	—	5.900	
	Schœdelin	—	26.859	
	Edouard	—	23.156	
	Chacha	—	4.707	4.545
	Marcelle	—	2.256	
	Sarah	Lignite	765	
		Bituminous	13.766	
Phan-Me	Louisette	Bituminous with	13.766	
	Co-Loung	23% of vol. matter	18.287	
Phu Nho Kwan and Shine	Paul		8.500	
	Doi Hoa	Semi-bituminous	2.294	
Tuyen Kwan	Alice	Lignite	11.562	
Cao-Bang	Henri	—	111	
Nong Son	Nong Son (1)	Non-bituminous		
		Total	920.900T	525.767T

*Not worked in 1921.

The Société des Charbonnages du Tonkin being by far the most important colliery owners the following table dealing with the port of Hongay for the year 1921 will give a fair idea of the principal markets for Tonkin coal:—

Flag	No. of Ships	Net Tonnage	No. of Tons Exported
Japanese	113	161.535	364.498
British	58	91.839	152.473
Chinese	4	4.147	5.694
French	3	3.763	6.300
American	2	3,230	5.709
Russian	1	1.492	2.600
Totals	181	266.006	537.274

The following table shows the pre-war and present prices of coal:—

	Pre-war		1921	
	Piastres	Gold Francs	Piastres	Gold Francs
Screened coal, at Tonkinese port	$6.50	fr.16.25	$9.50	fr.24.50
Small and nuts —	$6.00	fr.15.00	$8.50	fr.21.90
Fine coal —	$2.50	fr. 6.25	$4.00	fr.10.30
			$11.00	fr.28.40
Bituminous coal delivered station			at	at
Jialam or Phu-Ly	$6.00	fr.15.00	$12.50	fr. 3.25

The local demand has outstripped the means of production in spite of the efforts of the owners to increase the output, hence the present rise.

The Société des Charbonnages du Tonkin, the output of which rose from 550,000 tons in 1920 to 720,000 tons in 1921 and will probably reach 800,000 tons in 1922, is thinking of reducing its exports in order to meet the home demand.

At the present time Indo-Chinese buyers use but little fine coal from Hongay letting the Chinese take it at a low price, but the unscreened coal sold by this Company contains 42 per cent. of good coal and 57 per cent. of fine. Efforts are therefore being made to utilize this latter in the form of dust, and the Société des Distilleries de l'Indochine, having already obtained satisfactory results from a boiler fired by means of a pulverizing burner supplied by the Société des Combustibles Pulvérisés, is planning a central pulverizing station for a whole battery of boilers.

DEVELOPMENT OF OUTPUT.

Every colliery owner is doing his utmost to increase his output. The Société de Hongay intends to spend 26,000,000 francs on new work. The Société des Anthracites du Tonkin, a new Company who has bought the Maokné and Trang-Bach collieries in the Dong-Trieu district, is preparing to work these splendid deposits in the best manner.

The Société des Charbonnages du Dong-Trieu proposes to improve its means of transport by prolonging its mining railway on to the Song Da-Bach where a river port will be established.

The output of bituminous and semi-bituminous coals is also increasing, but is still far from meeting the demands of the local manufacturers. The Phan-Me coalfield (20,000 tons in 1920 and 32,000 tons in 1921) cannot be properly exploited until the canal running from the mining district of Thai-Nguyen to the waterways of Tonkin near Phu-Lang-Thuong has been cut: it is hoped to commence this work in 1922.

KEBAO COLLIERIES

NON-BITUMINOUS COAL.

Since the concession of this colliery in 1888 some 400,000 tons of coal has been extracted having the following composition: Ash, 5 per cent.; volatile matter, 7 per cent.; sulphus, 1 per cent.; fixed carbon, 85 per cent. and water, 2.5 per cent.

Much money was inconsiderately and prematurely wasted at first, more especially on a metre-gauge railway 8½ miles long from the splendid harbor of Port Wallut to the centre of the island, rich in coal, and the original Company went bankrupt, the colliery being left in the hands of Chinese middlemen, who merely scratched the surface. The present owners are trying to get things straight and are confining themselves for the present to working the western side of the island rich in thin and medium seams of coal (output in 1921 was 8,311 tons) and is utilizing the old railway extended by a contractor's line.

Hongay Collieries.

Sociètè Française des Charbonnages du Tonkin.

NON-BITUMINOUS COAL

The Chinese in 1865 were the first to work this coal-field. After Fuchs had prospected in 1882 and Sarran in 1886 the "Coal-field of Along Bay" (56,800 acres) were conceded to the Company now working them.

For want of markets the early days were hard, but since 1900 success has been assured and the shares of the Company issued at 500 francs (present nominal value is 250 francs) were quoted at 5,800 francs at the beginning of October 1922, although the value of the shares had been halved in 1919.

How the Coal-field is Worked.

The known seams of coal may be divided into two levels: *the coal Hatou level* containing four seams, of which the *Grande Couche* (main seam) is from 165 to 200-ft. thick (with about 100-ft. of good coal), and the others which make up in the aggregate some 50-ft. of good coal, and the *Nagotna level* containing about ten seams varying from 3 to 20-ft. thick.

At Hatou is extracted from the Grande Couche in three open workings, whence it is carried to Hongay by a metre gauge railway eight miles long; in 1921 257,000 tons were extracted.

Open workings on this same seam are to be found at Campha whence the coal (321,597 tons in 1921) reaches Hongay by steam launches or junks of 60 to 100 tons. The exceptionally favored position of this colliery on the sea-coast, with a seam 500-ft thick, of which 260 are pure coal, and the numerous known outcrops in the neighborhood, all point to a successful future.

Mention should also be made of the underground workings of Nga-Hai and Mong-Dzuong which supplied in 1921 66,933 and 74,465 tons respectively. This coal screened at the pits is sent by barges or junks either to the depôt at Hongay or direct to the customers.

Screening, Washing, etc.

At the Hongay depôt the coal is sorted into various sizes—0/12, 12/30, 30/50 (up to 1/2-ins., from 1/2 to 1-ins., from 1 to 2-ins.—and screened for sizes over 50 m (2 ins.), while nuts of 12/30 are washed.

A patent fuel plant is also to be found here, the four presses of which are capable of turning out 130 to 150,000 tons a year. Brai (a sort of pitch) is used to agglomerate 70 per cent. of Hongai small coal and 30 per cent. of Japanese bituminous coal.

This patent fuel is much appreciated; appended are analyses of the two sorts made.

Patent Fuel.

	ordinary			war		
Volatile matter without water	17.5	to 18	%	18	to 18.25	%
Fixed carbon	76	— 77	—	78.	— 81	—
Sulphur	.90	— .95	—	.70	— .75	—
Ash	7	— 8	—	5	— 6	—
Heating value	7,500	to 7,600		7,850	to 8,100	calories
Cohesion		70			70	

Boulets (patent fuel in a circular or oval form) are also turned out at the rate of 20 tons per machine.

There is further a battery of nine coke ovens capable of turning out from 25 to 30 tons of coke per day, but producing actually but 1,000 tons yearly. This coke is made from a mixture of 30 per cent. Hongay small coal and 60 per cent. Japanese bituminous coal.

The port of Hongay is equipped with a landing-stage 250-ft. long and two quays of 230 and 260-ft., fitted with seven steam cranes and two hydraulic cranes handling from 2,000 to 2,500 tons per day per quay.

The fleet of the Company is composed of six steam launches, ten 65-ton barges and thirty 100-ton junks.

Staff.

The native staff of the Company amount to 800 Chinese and 7,000 Annamites, but it is estimated that some 40,000 natives, including workmen's families, shopkeepers, etc., are supported by the collieries.

Proposed New Works.

It is proposed to create in the immediate future a new port as the eastern end of the concession a few miles from the open workings of Campha, with a landing-stage 820-ft long at which two ships of 8,000 tons and drawing 26-ft. could be loaded at the same time and equipped with five electric travelers, each of which would be capable of loading normally 150 tons an hour or 200 to 250 tons at "rush" times.

Nearby, screening and washing plants would be erected to deal with 250 tons of coal per hour, while the mines would be connected to the port and screens, etc., by a metre gauge railway.

A central electric station of 2,000 kw situated between Hongay and Hatou would supply all the power required at the open workings and ports.

DONG-TRIEU MINES

Anthracite Coal.

The two ranges of hills at Dong-Trieu, running from east to west and separated by the valley of the Song-Ky both contain several seams of coal. In the southern range bordered by the Song Da-Bach, by which the coal is transported, the principal colliery is that belonging to the "Société des Anthracites du Tonkin" (concession "Edouard" and "Schoedelin" and containing about twenty seams with from 3 to 20-ft. of coal, not yet worked except on the face and of which the 1921 output was 50,000 tons. Numerous other concessions are being worked in this southern range and they comprise from west to east:

Chacha	with an output of	4,707	tons in 1921
Espoir	—	5,900	—
Fabien	—	12,900	—
Renée	—	22,113	—
Espérance	—	1,450	—
Francis, Hien	—	10,706	—
Margot	—	1,800	—
Marcelle..	—	2,257	—

The output is increasing everywhere owing to the increased demand and the corresponding rising prices.

In the northern range of hills the "Clotilde-Louise" pit owned by the "Société des Charbonnages du Dong-Trieu" possesses some ten seams, of which it is working at present but four with a total thickness of from 50 to 65-ft. of coal (hard anthracite having but 3 per cent. of volatile matter). This coal is carried by a mining railway to the landing-stage, some nine miles away, of Uong-Bi on the Song Da-Bach: the output in 1921 was 24,857 tons.

PHAN-ME COLLIERIES

Bituminous Coal.

This field, discovered only in 1910, includes some ten seams of which the total thickness of coal is in some parts—the prospecting is far from complete—at least 65-ft., while one seam of lenticular shape is sometimes 33-ft. thick.

This coal contains on an average 22 per cent. of volatile matter, 18 per cent. of ash and from 1 to 1.5 per cent. of sulfur and burns well, being much in demand for mixing with small non-bituminous coal. It yields a light and hard coke which, according to experiments made both in a laboratory and in a cupola appears to be suitable for all metallurgical operations.

Unfortunately transportation from the collieries is still bad, as the coal has to be brought down by a narrow contractor's railway to the landing-stage on the Song-Cau, whence 4 to 5-ton sampans take it to Thai-Nguyen where it is transhipped into 15-ton junks which bring it to the railway or to some large river-port. The output has, however, increased from 20,000 tons in 1920 to 32,000 tons in 1921 and when the canal now being cut to this coal-field is completed this colliery should boom.

COAL-FIELD OF PHU-NHO-KWAN AND SHI-NE

SEMI-BITUMINOUS COAL.

The deposit of Phu-Nho-Kwan, 7½ miles from a river up which junks of 50 tons may be towed and which is connected by water to the railway station of Ninh-Binh, 25 miles further on, comprises a considerable number of seams of lenticular shape of thicknesses varying from 16-ins. to 16-ft. The coal contains on an average 17 per cent. of volatile matter and 5 per cent. of sulphur and is much sought after for mixture with non-bituminous coals in spite of its high percentage of sulphur.

The production in 1921 was 8,500 tons in spite of the two transhipments between the collieries and Ninh-Binh.

At Shi-ne working, started in 1912, was abandoned in 1914, but a fresh start was made in 1920.

The strata, much twisted, contains some ten seams of coal of lenticular shape. This coal contains an average of 20 per cent. of volatile matter, 7.5 per cent. of ash and 4.2 per cent. of sulphur and the output in 1921 amounted to 2,294 tons. From the colliery a contractor's line of five furlongs runs down to a neighboring river, navigable by 20-ton junks.

TERTIARY COAL.

Numerous small fields of tertiary coal (of the nature of lignite) are to be found in Tonkin.

That of Dong-Jiao, near the Hanoï and Vinh railway and which was actively worked from 1905 to 1911, supplied 106,000 tons of lignite to the Tonkin railways from a 30-ft. seam the working of which was abandoned at the depth of 115-ft.

The colliery at Tuyen-Kwang, equally well situated and in work since 1915, furnishes an excellent lignite which contains on an average 35 to 40 per cent. of volatile matter, 8 to 12 per cent. of ash and 1½ to 2 per cent. of sulphur. At the present time a seam, 8-ft. thick, is being worked underground; the output was 20,000 tons in 1915, but only 11,562 tons in 1921 owing to inadequate means of raising it. After being washed, the coal is taken by a contractor's railway some five furlongs long to a landing-stage on the Clear River were it is dumped into 50 and 100-ton junks.

Mention may be made of the as yet unworked tertiary deposits of Yen-Bay and of Langson, of those of Cao-Bang, occasionally worked, and of Dong-Ha, worked since the end of 1920 and daily producing at the present time 6 to 8 tons of lignite.

II.—Zinc Mines

GENERAL.

Zinc ore, which is second in importance to coal, is to be found chiefly in the extensive group of limestone mountains of the primary period bounded by the Clear River, the Red River and the railway between Hanoï and Langson.

In the outcropping workings of to-day the ore is found in the form of calamine or oxydized ore (carbonate and silicate of zinc) in pockets in the limestone, often where this lies on the schist of the same period, while it becomes blende (sulphide of zinc) as the depth increases and is found more in lodes, such as has been already worked in some old mines, for instance at Lang-Hit.

Many of these old mines were worked by the Chinese who often left most of the zinc ore in favor of the argentiferous lead, sometimes keeping a little for the minting of sapeks. The ore was occasionally reduced at the mine, but more frequently it was taken to a coal-field or at least to some water-way and reduced in works, ruins of which have been found near Thai-Nguyen and near the post of Trang-Bach in the Dong-Trieu district.

From 1905, when it became possible to peacefully prospect for minerals, a series of discoveries were made, such as, to mention only the principal ones, the deposits of Trang-Da in 1905, of Lang-Hit in 1906, of Thanh-Moi in 1907, of Chodien in 1908 and of Yen-Linh in 1909.

The following table gives the output of zinc since 1905 and also show the effect of the present world depression in the metal market :—

TOTLA OUTPUT OF ZINC MINES FROM THE BEGINNING OF EUROPEAN WORKING UNTIL 1921 INCLUSIVE.

Year	Mine	Province	Output (weight)	% of zinc	Staft in 1917		
					Europeans	Annamites	Chinese
1905	Trang-Da	Tuyen-Kwang	134.482	45	11	1,280	—
1907	Lang-Hit	Thai-Nguyen	131.458	50	15	1,100	—
1908	Thanh-Moi	Lang-Son	27.590	52	4	200	—
1911	Yen-Linh	Tuyen-Kwang	16.754	50	7	570	—
1911	Van-Lang	Thai-Nguyen	5.272	45			
1914	Bac-Nhung	Tuyen-Kwang	1.110	50			
1914	Cho-Dien	Bac-Kan	64.170	49	13	1,280	200
1916	Pac-Van	Bac-Kan	10.935	48	4	370	150
			391.711T		54	4,800	350

Prior to 1914, the Tonkin zinc mines exported all their output to Europe. In the early days of the war a few consignments were sent; but the rise in the price of freight since 1915 has killed that trade for the time being at any rate. The rise in the price of zinc co-incided happily with the arrival of Japanese buyers who bought this metal at very remunerative prices, but when Russia broke down during 1918 the Japanese ceased to buy.

The ore was then stocked at Haiphong and at the end of 1919 freights came down, so that with the aid of export-bounties granted by the government of Indo-China it was possible in 1920 and 1921 to get rid of this stock of 60,000 tons which had become a heavy charge on the mine owners.

In spite of the gravity of the crisis which is paralyzing the mines of the whole world, two Companies have kept their mines going, Trang-Da with an output of 6,614 tons in 1921 and Chodien with 3,477 tons in the same year but much of their activity is devoted to prospecting.

The confidence which the industrial world has ever manifested in the future of the zinc mines of Tonkin is shown by the decision arrived at in 1920 and 1921 by the Compagnie Minière et Métallurgique de l'Indochine, a company with a capital of 16 million francs and founded by the Compagnie Minerais et Métaux, the Société de la Vieille Montagne, the Compagnie Royale Asturienne, the Société de Penarroya, etc., to acquire the important mines of Chodien and to erect at Kwang-Yen, close to the coal-fields and on the banks of one of the chief water-ways of Tonkin, works for the treatment of calamine and capable of turning out yearly 6,000 tons of metal—in pigs and rolled*. Later, these works will be enlarged in order to reduce the sulphur ores of zinc, lead and similar metals.

Towards the end of 1921 work was begun on a jetty in the Song Da-Bach accessible to barges of 120 tons, and it is hoped that the first of the three furnaces, each of the yearly capacity of 2,000 tons of metal will be ready by April 1923.

At the same time the Company states it will very shortly resume active operations at its mines at Chodien.

TRANG-DA MINE.

This mine, now belonging to the Société des Mines de Trang-Da is very advantageously situated on the bank of the Clear River opposite the town of Tuyen-Kwang, whence 50 to 100-ton barges can transport the ore to Haïphong, 155 miles away.

This deposit which crosses a rocky eminence on the edge of the river and then strikes downwards had been worked by the Chinese in search of argentiferous galena. The ore is found in strata in the limestone or else in perpendicular faults, and since the mine has been rediscovered and worked on European lines practically nothing but calamine has been extracted, but gradually sulphatic ores, such as blende and galena, are now being found.

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*In view of the help given by the British government to similar enterprises in its colonies it is as well to call attention to the fact that the *Compagnie Minière et Métallurgique de l'Indochine* anxious to maintain its commercial independence, more especially as regards the purchase of rail material, eventually declined to accept the Indo-Chinese government's subsidy which it had originally asked for, as this would have entailed restrictive regulations.

The mine possesses a fairly complete crushing plant capable of dealing with 20 tons a day, such being necessary when dealing with this class of ore, and also 8 kilns (five with 12-ton coppers for reducing the bigger pieces of ore, and 3 reverberating kilns for the small pieces, capable of producing, if all working at the same time, 78 tons of calcined calamine* a day.

This Company places four kinds of ore on the market :

1st quality with over 50 per cent. of zinc ;

2nd quality with from 45 to 50 per cent. of zinc :

3rd quality with from 34 to 40 per cent. of zinc.

Ferruginous quality, with from 34 to 40 per cent. of zinc, suitable for making oxyde of zinc.

CHODIEN MINES.

The mining district of Chodien is situated to the north of the halmet of Ban-Thi, some 12 miles as the crow flies to the east of the Song-Gam, a tributary on the left bank of the Clear River into which it flows near Tuyen-Kwang. The ore is transported from Na-Don on the Song-Gam in 8 to 15-ton sampans according to the season and transhipped at Tuyen-Kwang, 37 miles further on, into 50 to 100-ton barges which are towed down the river.

But to connect the mines with Na-Don through a hilly country has necessitated the building of a railway 20 miles long having a gauge of 23$\frac{5}{8}$-ins., maximum gradients of $30\frac{0}{00}$, curves of a radius as low as 27 yds., 21-lb. rails and 5-ton locomotives. Further, as the station of Ban-Thi stands at 918-ft. above sea-level while the actual mines lie between 1,850 and 3,000-ft. above sea level it was necessary to connect the working faces by means of surface railways with a two mile long self-working aerial rope-way, carried on wooden pillars at a slope of 1 in 5.6 and capable of delivering 10 tons an hour in 440-lb. skips. It is proposed to erect a collecting cable with skips weighing 770-lbs. and capable of delivering 25 tons per hour.

Such important installations are not often found in connection with mines of calamine, but the extreme richness of the large pockets of ore found in the limestone at Chodien fully justifies this expense.

The ore is calcined at Banthi, after such washing as may be necessary, the larger pieces being treated in a coppers (5 kilns produce 18 tons of calcined ore per day) and the smaller in a reverberating kiln (6 of 3$\frac{1}{2}$ tons each) ; these kilns are heated by wood.

LANGHIT MINES.

The mines of Langhit, situated not far from the Song-Cau, some ten miles to the north of Thai-Nguyen, were formerly extensively worked by the Chinese.

These mines (concession Métis) as well as those of Mo-Ba (Mo-Ba concession) and Bac-Lao (concession Lucie) are all sunk in a series of faults in the limestone and schist and at a very slight depth the mineral changes to blende. Since 1905 they have been actively worked by Europeans, but work had to be suspended in February 1918.

At the Langhit mine (260-ft. above sea level) the Company had erected a central station of 250 h.p. supplying power for lighting the underground workings, for working the drills and for pumping as well as a small hand worked washing plant.

At Mo-Ba (660-ft), two miles from the Langhit mine, there was a small washing plant and a 20 h.p. steam engine, but it was at Bac-Lao (1,300-ft.), some 1$\frac{1}{4}$ miles from Mo-Ba, where from the very first the output has been the highest ; here was to be found a 50 h.p. steam engine.

These three mines were connected to each other and to the landing-stage on the Song-Cau, known as the Langhit River and and 2$\frac{1}{2}$ miles from Langhit, by a system of small railways, inclined planes and aerial rope-ways. The ore was sorted at the pit-head and the better class was sent down to the landing-stage, while the mixed and low-grade ores were stocked near each pit. Close to the landing-stage were five kilns with coppers capable of producing from 12 to 15 tons of calcined ore per day.

At Langhit River a factory for making zinc white, and capable of turning out daily 2 tons of oxide containing 70 per cent. of zinc from the low-grade ores had recently been erected. Here were to be found also the general repairing-shops, which obtained their power from a 50 h.p. thermo-electric station, the stores, stocks of ore and the offices.

From here 4-ton sampans carried the ore to Thai-Nguyen, where it was transhipped into 15-ton junks, and again at Dap-Cau into steam launches.

THAN-MOI MINES.

The Société Minière de Than-Moi, which stopped in 1918, worked pockets of calamine and strings of lodes containing both calamine and blende in the limestone group of mountains, close to the railway from Hanoï to Langson.

YEN-LINH MINES.

The deposits of Yen-Linh are similar to those of Trang-Da (not far away) and the mine is connected to the Clear River three miles above Tuyen-Kwang by a small railway four miles long. Near to the landing-stage are to be found two calcining kilns with coppers.

VARIOUS DEPOSITS.

A great many other deposits exist in Tonkin some of which might in the futuie become important. Some it is true appear on the surface to be worked out, but the natural irregularity of the deposits of calamine makes it impossible to condemn them without further exploration. Others have been neglected, either through their having been discovered too late to have permitted their working before the war broke out or because of the present difficulties of bringing down the ore to where it can be utilized.

Steel File Improvements

CONSIDERING the long period of years during which files have been used by workmen of many trades, it is remarkable how grossly these valuable tools are mishandled and neglected. In use, they are often treated unfairly by the wrong file being selected for a particular job and when idle, they are often kept in a bag or drawer so that they damage each other, as well as other tools. In the matter of selecting files the amateur mechanic is generally at a disadvantage compared with the more experienced workman and, as almost every household has its "handy man," a leading British steel firm has made up a set of files meeting all ordinary requirements. There are ten files in the set, but two of them are special files, bastard-cut on one side and smooth-cut on the other, so that the set is really equivalent to twelve tools. These have been selected, from the thousands of files available, as being the most likely to be of service to the amateur, the private workshop, the model engineer, and the jobbing workman. The files are mounted in a neat wooden rack so that all can be seen and the desired one selected instantly. A booklet of information tells what each file is to be used for, and how it should be handled, and the set is completed by that oft-neglected accessory, a "file card," with which the files should be cleaned after use. The steel used for each file is the most suitable for the purpose, and the teeth are cut accurately to the most efficient form, but these advantages are naturally lost if the file is allowed to become clogged with particles of metal.

Economy in Cabling

AS a means of stimulating international trade a new practice is being introduced to mercantile houses and manufacturers by a British publisher who has printed special codes respectively for the chemical and the iron and steel trades. The effect is to afford a means by which messages concerning quantities, qualities, prices, sizes, specifications, and shipments can be sent by cable in severely abbreviated form with absolute accuracy. The exchange of ordinary commercial phrases is not affected ; for these the firm cabling may use any of the general codes. But an astonishing amount of special trade information can be packed into two or three words by means of these new SELWYN codes, and experience has proved that the monthly cable bills of merchants and manufacturers can be cut in half by this ingenious method of condensation. On the other hand, it is now often worth while to make inquiries by cable, the cost of which would otherwise be prohibitive and thus more business is likely to be done.

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*Calamine is calcined in order to reduce its weight by expelling its carbonic acid gas.

Coal Mining in the Maritime District

By E. Pak in the New Russia

I. Resources

A REGULAR and systematic investigation of the mineral wealth of the maritime district has so far not been carried out. The plan drawn up in 1912 for the systematic exploration of the Russian Far East, and the maritime province in particular, on account of the world war and civil war could not be materialized.

The activities of the scientific investigators were directed mainly to the study of separate deposits of minerals. In the maritime province a detailed study was made of the Souchansky coal mine, of the lignite deposits in the neighborhood of Ugolnaya station, the Nikolaevsk coal mines, the west bank of the Gulf of Amur, the iron ore deposits of the Olginsky district, the silverlead deposits of the Tetukhe, and the gold ore of Askold Island.

The total amount of investigation made in the Amur and maritime provinces is shown by the following figures :—

District surveyed more or less fully	0.80%
District partly and occasionally investigated ..	48.08%
Not investigated	41.12%

The main deposits of coal in the South-Ussuriisk district may be divided into four groups, stretching from the southwest to the northeast. The western group is that of the western shore of the Gulf of Amur, and with this is probably connected the Nikolsk-Ussuriisk coal. Further east, on a line with this group, run the coal deposits of the Muraviev-Amur peninsula, the extension of which on the north is the coal of the village of Radchikhi. The third group is that of Petrovsko-Vasilkovo, and the most eastern is that of the Souchan river and its upper reaches. By no means are all the deposits of coal included in these four groups. Especially may be mentioned the coal of the upper reaches of the Suifoon, the Lipovetsky mines, and certain parts of the shore of the Sea of Japan.

In the Ussuriisk district there are altogether 69 deposits of coal. Of these only nine are being worked. The principal place is taken by the Souchansky government mine, after which come the Lindgolma mines, the Marguaisky, those at the station Kiparisov, those in the neighborhood of Nikolsk-Ussuriisk, the Lipovetsky mines, etc.

There is both anthracite and bituminous coal. A variety of the latter is well known in the Souchansky district, and in the upper reaches of the Suifoon river. Not long since excellent coal was found on the western shore of the Gulf of Amur.

The resources are most fully investigated at the Souchansky mine, where they amount to 40,000,000 tons. The other deposits are comparatively little investigated, but their general reserves may be taken conservatively as 30,000,000 tons.

Lignite deposits in the maritime province are known in various places, beginning from Possiet along the western shore of the Gulf of Amur, near the mouths of the Suifoon, on Cape Retchnoy, etc., but the main field is near Ugolnaya station, on the Souchansky railway. Further, they are known near Lake Khanka near the Ussuriisk Gulf, between Tsimukhe and Kangauz, in the upper reaches of the Daubukh and Ulukh, in the coastal strip of the Sea of Japan on the Nizmenny Cape, along the rivers of Tadushu, Amgu, Kulumbe, and in other places.

There are altogether 38 deposits of lignite registered in the South Ussuriisk district. First among these are the Zybunny mine, the Krayeugolno-Slassky, the Alexeievsky, the Nikolaevsk, etc.

The total reserves of lignite in the Ussuriisk district are unknown. They are calculated only for the Zybunny mines of Skidelsky, the Uglavaya station district, and the Nikolaevsk mines on the western shore of the Gulf of Amur. The reserves of the Zybunny mines are calculated at approximately 32,000,000 tons, the Nikolaevsk mines at 12,500,000 tons, and the Uglavaya station district at 32,000 tons.

The total reserves of lignite in the maritime district may be roughly estimated at 80,000 tons.

II. Development

Coal mining is the most important of the different mining industries in the maritime district of Far Eastern Russia.

The Souchansky or Souchan coal mines, containing the best and richest deposits, are in the hands of the government, and working under its control.

The mountain range containing the Souchan mining district covers an area of 820 square miles. Of this area the best and richest coal-beds occupy about 90 sq. miles, of which some 13 sq. miles are actually under exploitation.

As to the chemical composition and physical properties of the coal found in the Souchan region, there are several grades, ranging from anthracite, with low ash content, to the long-flaming coke-oven soft coal. At present, mostly soft coal is being mined.

The activities of these enterprises are shown by the following table :—

Year	*Coal mined, in tons*
1913	163,865
1914	205,920
1915	204,864
1916	270,302
1917	294,135
1918	205,945
1919	118,247
1920	119,148
1921	118,755
1922	138,460

In comparison with the year 1921, the production of coal during 1922 increased more than 16 per cent. The same year some 80,000 tons of coal and 319 tons of coke were disposed of to consumers, as may be seen from the following table of Souchan coal consumed :—

Ussuriisk Railway	20,125 tons
Government institutions	17,526 ,,
Private consumers	7,098 ,,
Exported to Manchuria	20,072 ,,
Exported overseas	15,139 ,,
Total	79,960 tons

The possibility of big exports of Souchan coal to foreign countries undoubtedly exists.

In the year under discussion (1922) consumption of coal for operative uses in the mines, plus the usual mining losses, amounted to 40,274 tons, i.e., 36.3 per cent. of the total production, which is very high. The consumers of Souchan coal during 1922 were supplied chiefly with common varieties of soft coal, at the price of G.Rs.15.80 per ton f.o.b. point of destination.

Souchan coal mines during the last year have produced coal and by-products to a value of 1,287,750 gold roubles. The staff employed during the same year consisted of :—

Technicians and clerks	180, or 9 per cent. ;
Laborers	1820, or 91 per cent. ;

of which latter 1540, or 77 per cent., were Russian, and 460, or 23 per cent., Chinese.

With the exception of the Souchan district, all the coal and lignite mines situated in the maritime district are in the hands of private firms and individuals. These mines are centered mainly in the South Ussuri district, along the Ussuri Railway, on the shores of the Gulf of Amur, and near the cities of Vladivostok and Nikolsk-Ussuriisk.

Part of these privately operated mines are situated near the station Ugolnaya, on the Ussuri Railway. Other mines are to be found near Nikolsk-Ussuriisk, on the western shores of the Gulf of Amur, and near the town of Possiet. In the districts mentioned there are only four coal mines, but twenty lignite.

In the maritime district there are 202 coal and lignite mining sections, of a total area of 61,474 acres. Only 32 of these were actually worked during 1922.

According to information gained from different surveys and from mine operators and technicians, there exist profitable coal-beds over an area of 19,068 acres, representing 31.1 per cent. of the total coal-bearing area of 61,474 acres. These figures are by no means final, and are probably below the actual areas.

The coal-bearing area now under actual exploitation amounts to about 1,530 acres, or 2.4 per cent. of the total. This area of 1,530.41 acres can be subdivided as follows :—

Veins worked	502.01 acres, or 32.80%
Opened, and prepared for work	115.73 acres, or 7.56%
Being opened	595.88 acres, or 38.94%
Covered by buildings, etc. ..	316.79 acres, or 20.70%

The total mass of coal veins worked by all concerns amounts to 330.19 cubic feet ; the greatest and the least thicknesses for different veins are respectively :--

Coal, maximum	7 sq. feet
Lignite, maximum	13.3 ,, ,,
Coal minimum	3.15 ,, ,,
Lignite, minimum	3.85 ,, ,,

On account of this variation in thickness of the veins, the production in different mines ranges all the way from 3.27 tons of coal (Mongugai mines) up to 19.65 tons of lignite (Kraye-Ugolno Spasovsky mine) per cubic sazhene.* Lignite mined in this region weighs 9 to 12 tons, and the same bulk of coal 9.80 to 13 tons.

Information concerning the actual working field of the shafts was received from 12 enterprises of the 23 at work, and gave the total field worked as 344.1 acres, with total resources (in 19 mines) of 35,835,170 tons. The total amount of coal uncovered and ready for immediate mining totals 688,087 tons.

As shown above, the area of all mining claims totals 61,474 acres. The coal supply stored underneath this area can be reckoned as follows :—

(a) Certain	13,955,760 tons
(b) Probable	40,753,440 ,,
(c) Possible	113,349,600 ,,

In the fiscal year 1922, mining operations were carried on by 23 enterprises out of 32. Five of the remaining mines were shut down altogether, in two investigations and surveys were being made and of two there was no information.

Besides the Danilovsky mine (Borodin's Sons & Co.), shut down the previous year, and the Mogugai mine (Britter & Co.), mining operations were discontinued in Lassman's "Discovery" mine, in place of which, however, work was started in the "Second Discovery" mine.

From January 1 to December 31, 1922, all privately owned and operated coal mines produced :—

(a) Coal	79,245.79 tons
(b) Lignite	341,052.55 ,,
Total	420,298.34 ,,

The production of these mines last year increased 88,746.08 tons over that of 1921.

The amount of coal and lignite produced by privately operated mines during the last eleven years is shown in the following table (in tons) :—

Year	Coal	Lignite	Total
1912	82,524.30	77,219.33	159,743.63
1913	69,253.67	104,800.61	174,054.28
1914	106,072.82	126,842.58	232,915.40
1915	66,348.30	186,313.91	252,662.21
1916	99,083.02	224,583.98	323,667.00
1917	100,023.09	216,192.56	316,215.65
1918	61,107.76	261,751,33	322,859.09
1919	81,456.39	281,206.09	362,662.48
1920	40,466.62	289,438.78	329,905.40
1921	40,346.62	290,094.92	330,441.54
1922	79,237.79	341,052.54	420,290.33

The above table shows the steady growth of lignite production as compared with coal. At the same time, increased production of coal is noted. The quantity mined during 1922 almost reaches the level of 1919, but amounts to only 12.21 per cent. of the total production of coal and lignite.

The coal mined amounted to about double the production for 1921, and 18.8 per cent. of the total production of 1922, while the quantity of lignite also markedly increased, being 50,957.64 tons more than the previous year.

According to data at hand, all the privately owned and operated coal mining enterprises in the maritime district disposed of during 1922-1923 :—

(a) Coal	55,254.18 tons, or 15.38%
(b) Lignite	303,927.57 tons, or 84.62%
Total	359,181.75 tons — 100%

or 85.40 per cent. of the total produced.

For their own needs (boilers, heating of buildings, etc.) the mines consumed :—

(a) Coal mines	10,367,75 tons — 29.92%
(b) Lignite mines	24,290.57 tons — 70.08%
Total	34,558.32 tons — 100%

or 8.24 per cent. of the total production.

At the time this data was compiled the actual reserves of different grades at the mines were :—

(a) Coal reserves	17,064.97 tons	84.16%
(b) Lignite	3,198.76 ,,	15.84%
Total	20,263.73 tons —	100%

The large amount of coal stores is accounted for by quantities of small broken coal and coal-dirt, accumulated for several years past. Stores of this kind are reckoned at 14,609.22 tons.

During the last marketing campaign mostly large and medium-size coal was sold, there being little demand for small nut grades. The prices for the first two grades fluctuated from G. Rs. 5.50 to G. Rs. 16.20 per ton, and for nut coal from G. Rs. 2.70 to G. Rs. 6.20 per ton, all prices f.o.b. car at mine. There were considerable price fluctuations in coal marketed, due chiefly to local conditions.

To sum up, it may be said that with regard to the actual resources of this region, its mining industry possesses all the factors conducive to future development along broad lines. The total quantity of coal in prospect is reckoned at 7,640,800 tons, but this figure is far below the probable quantities hidden underground in this region.

Less inspiring are the immediate prospects for the marketing of coal produced. The local demand is now fully covered, and there are probabilities of a growing demand being created through increase of local consumption. There are also possibilities for export to foreign countries of high-grade coal, particularly from the Souchan mines, but before this can be carried out on a big scale it is necessary to connect this region with Discovery Bay by rail.

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* 1 Cubic sazhene = 343 cubic feet.

A New Type of Electric Furnace

RECENT advances in the metallurgy and heat treatment of steel have made it more than ever important to employ a clean source of heat, free from fumes and ash and under very accurate control. These requirements are fulfilled completely by the electrically heated muffle furnace. Heat is generated by the resistance offered to the flow of electric current through wires or rods of special composition and, as there is no combustion, there is no waste of heat or material and no possibility of contamination. Also, the degree of heating can be regulated instantly by varying the strength of the current. Generally, the heating wires or rods are placed outside the refractory tube or chamber which forms the furnace, but a British firm of engineers, who have specialised in furnace construction for many years, have perfected a method of heating the furnace internally. The furnace chamber is built to any desired shape and size by the use of a new type of refractory brick. Grooves in the bricks form continuous channels for the reception of the heating wires or rods. The latter are quite free to expand but they cannot fall out of the channels and, although the channels are open on the inner side of the furnace, the heating elements cannot come into contact with the work in the furnace. This construction amounts to making the inner surface of the furnace the source of heat and it is, of course, uniformly hot all over. Apart from the advantages in point of thermal efficiency, there are mechanical features which make the new furnace exceptionally durable. By building the heating chamber from standardised components it can be made of any size from 2 cu. ft. (0.05 cu. metre) up to 3,000 cu. ft. (85 cu. metres) or even larger. The applications of these furnaces cover an equally wide range ; for example, the baking of pottery, the annealing of sheet metal and wire, and the heat treatment of locomotive cranks, coupling rods and billets.

An Orgy of Mismanagement

(Continued from page 585).

OFFICE OF THE GOVERNOR-GENERAL OF THE PHILIPPINE ISLANDS

Manila, April 29, 1922.

My dear Mr. Wilson :

With reference to the general policy for the bank as outlined by the board of control, I want to impress upon you that the board is desirous not to embarrass the national bank in any way in carrying out its true policy, the policy which is in accord with the general policy expressed by the secretary of war, namely, of getting the government out of business as rapidly as practicable.

It is desired by the board of control :

(1) That the bank proceed with all possible vigor consistent with good business methods to liquidate its assets in order that it may repay its obligations to the insular government.

(2) That no new business enterprises be entered into either directly or indirectly, and that the bank avoid, as a matter of general policy, activities which will result in the national bank, operating largely with government funds and practically without reserves, entering in competition with private institutions operating with private capital.

(3) That offices of the bank be closed at places where they are not making an actual profit and at places where commercial banks offer reasonable banking facilities.

(4) That all banking operations be conducted on the most conservative and careful lines.

(5) That the bank cash checks drawn on it as received by the government.

(6) That it restore the sum of P.11,964,000 on old deposits in monthly installments as contemplated in the budget.

(7) That it replaces approximately P.800,000 insular revenues used by the bank in January and February.

(8) That only the amount of money be advanced to the sugar centrals necessary to enable their economical operation.

(9) That in view of the approved policy of converting the national bank into a bank whose principal activities will be those of a modern constructive agricultural bank, the policy of the bank should be to this end.

(10) That no further advances be made to the oil mills except to handle the copra and oil now on hand with a view to carrying out contracts already made, and that no new contracts be entered into untlr the detailed general statement of the situation, to be presented in youi report of April 30, has been presented to the board of control and received its formal approval.

As it is no longer to the true interests of the government to continue to furnish assistance to the oil mills except under the conditions above prescribed, a program should be submitted looking to their liquidation and salvage as quickly as practicable. The present needs of the government for actual cash to maintain the necessary services are so pressing that it is highly inadvisable to continue to furnish assistance on oil propositions, as the return of the advances made is at best problematical.

The board of control appreciates the efforts being made, but on the other hand it appreciates the gravity of the situation.

In this connection, your attention is invited to letters of April 5 to the general manager of the national bank and to the chairman on the board of directors, also to copy of letter of April 5 addressed to the chairman of the committee appointed under Executive Order No. 54, both of which have received the formal approval of the board of control. Attention is also invited to copy of letter of February 7 addressed to Mr. Unson, chairman of the board of directors of the Philippine National Bank, transmitting, for the information of the board of directors and the general manager of the bank, copy of the report submitted by the committee appointed under Executive Order No. 54. Your attention is likewise invited to the fact that this report was approved by the board of control ; also to copy of letter of March 13 and other correspondence which clearly indicates the general policy which the board desires the bank to pursue.

Sincerely yours,

(Sgd.) LEONARD WOOD,
Governor-General.

Mr. E. W. Wilson,
General Manager, Philippine National Bank,
Manila.

THE SECOND LETTER.

OFFICE OF THE GOVERNOR-GENERAL OF THE PHILIPPINE ISLANDS.

Manila, February 1, 1923.

Sir :

Your attention is invited to the following letter setting forth the policy of the board of control with reference to the bank :

(Letter, Board of Control of April 29, 1922).

The above letter clearly expresses the policy laid down by the board of control. This policy continues in force, and no steps whatever will be taken which in any way tend to further involve the government in business or to extend the business interests or enterprises which it already has, and no new ones will be undertaken. The purpose of the federal government and the insular government is to get this government out of business as rapidly as we can do so with due regard to the interests of all concerned.

Very respectfully,

(Sgd.) LEONARD WOOD,
Governor-General.

Mr. Wenceslao Trinidad,
President, Philippine National Bank,
Manila.

I commend to your very careful consideration the reports of Haslkins & Sells and Messrs. Wright and Martin. The Philippine Nationa-Bank was established by act of the Philippine legislature at a time when many governments were forced into business by the necessities of war. The same causes which operated to bring about the almost universal failure of such activities,--inexperience, mismanagement, and in many cases criminal carelessness, brought about the failure of the national bank.

You have before you the pertinent facts as to the condition of the bank and the condition in which the government has been placed by its activities. It is incumbent upon us to arrive at a solution which will protect all interests, especially those of agriculture which is the basis of our prosperity, and which will be in harmony with the policy of the home government which is to leave the field of commercial business open and free to private capital upon terms which will encourage the rapid development of our great but latent material resources for the benefit of the people as a whole. I trust the legislature will take no steps which will hinder the efforts of the board of control along the lines above indicated. In the meantime careful study is being made of the best methods of providing for agricultural relief and co-ordinating the operations of rural credit associations.

LEONARD WOOD,
Governor-General.

The Wright-Martin report, which embodies all the main features of the Coates report, as appended, follows :—

" It is the purpose of this report to bring together in brief form the factors which are essential to the formulation of a definite future policy for the Philippine National Bank.

" The first authentic knowledge as to the condition of the bank is found in the voluminous report of Francis Coates, Jr. As a result of certain disquieting rumors reaching Washington in the summer of 1919, the secretary of war authorized an examination of the bank to be made by Mr. Coates, who was at the time clearing house examiner for Cleveland, Ohio, and an examiner of national reputation. Mr. Coates began his examination on November 30, 1919, and was forced on account of sickness to conclude it rather abruptly on April 11, 1920, before having fully accomplished his purposes. Owing to sickness his report on the examination did not reach Washington until September, 1920. On March 3, 1921, Mr. Coates submitted a supplemental report covering the operations of the currency reserve funds of the insular government in connection with the operations of the bank.

" As a direct result of this examination the bank was placed under new management in the person of Mr. E. W. Wilson, an experienced banker of San Francisco, and the writer was selected to make further and more detailed examination of the bank, as recommended by Mr. Coates ; both arriving in Manila the first week in January, 1921.

" It is rather difficult to summarize the voluminous report of Mr. Coates. For present purposes, however, his findings may be grouped under the following heads :—

Report of Francis Coates, Jr.

" A. BANK'S CONDITION AS TO SOLVENCY. (Mr. Coates' findings are quoted in full below :)

" 'A review of the examiner's digest and summary of values of folio 13 will indicate that, on the basis of his estimates, the surplus and profits of the bank, aggregating P.6,196,428, are entirely wiped out, by estimated losses aggregating P.10,697,166, thereby impairing the capital stock by P.4,500,738. The paid and subscribed capital of the bank is P.12,980,000, leaving a margin of capital, unimpaired, of P.8,479,262 against which is scheduled : slow, non-liquid and questionable values, P.8,550,107, slow, non-liquid and problematical values P.6,926,530, and undetermined values of P.8,728,353, a total of P.24,204,990.

" 'In addition to this, we have to consider that class of assets that is scheduled as "slow and non-liquid but ultimately solvent values," aggregating P.25,311,119, and also non-liquidity represented by the depletion of (and the necessary future restoration of) the cash reserve fund amounting to P.30,000,000 and the certificate reserve fund (of the insular treasurer) amounting to P.80,000,000.

" 'All this must be considered, and carefully weighed, in order to determine whether or not the capital is impaired or whether it is entirely wiped out, and, accordingly whether dividends must be suspended.

(It should be stated here that Mr. Coates' examination did not cover the assets of agencies and branches amounting to some P.26,585,000.)

" 'As bearing upon this question of the degree of solvency, it is important that we have also a definite knowledge of the earning power of the bank, and whether or not the integrity of the earnings, and of the earnsing accounts of surplus and reserves and undivided profits is assured ?'

Analysis of Coates' Report

" The analysis of Mr. Coates showed that there had been placed in these accounts the sum of P.730,630 which had not been collected : that uncollectible interest in the sum of P.359,210 had been similarly entered, and that the additional amount of P.364,020 interest on doubtful loans had been added to assets already undesirable. In regard to this Mr. Coates says,—

" 'The increasing of the assets by charging into them accounts that are known to be worthless, or accounts that are known to be non-liquid, for the purpose of creating 'paper earnings' out of which dividends may be paid and reserves set up is more than a fallacy, and a continuance of these practices can spell but only one result—disaster.'

"Nowhere in his report does Mr. Coates come to any definite conclusion as to the solvency or insolvency of the bank. The actual results of his examinations, however, indicate the necessity of a complete examination, verification and valuation being made without delay, in order to determine the true degree of solvency or insolvency.'

"Nevertheless, the fact that the bank was in a very critical position is revealed upon nearly every page of his report which sets forth a most amazing record of inefficiency, carelessness, ad mismanagement. Herein lies the main value of his report.

Findings as to Management

"B. FINDINGS AS TO MANAGEMENT: In regard to the bank as a whole he states that the head office in Manila exercised practically no control over the agencies and branches with the result that a satisfactory combined statement of the business of the bank as a whole had never been made. Accounts with agencies and branches remained unreconciled for months and in one case no report at all was ever received from one agency. The Manila office apparently knew and cared little about the affairs of the agencies and branches.

"Not only was this true but a decided lack of co-ordination in the Manila office was plainly evident. There was no record showing the combined liability of borrowers. Credit was extended in one department in entire ignorance of what other departments were doing. Loans were made by branches, the proceeds of which were used for paying loans due at the head office. In other words there was woefully lacking any comprehensive scheme of administration whereby there could be maintained a proper knowledge and control of the operations not only of the head office but of the bank as a whole.

"However competent and conscientious the management might be, under these circumstances, the bank was evidently headed directly toward disaster. What, then, is to be said when the evidence plainly showed that the management was neither competent nor conscientious?

Currency Reserve Funds

"DEALINGS OF THE BANK WITH CURRENCY RESERVE FUNDS: Possibly no other page in the history of the bank was fraught with such harmful consequences to the government as that relating to its dealings with the currency reserve funds. An almost blind stupidity characterises the history of these transactions.

"For twelve years the carefully devised currency system had worked successfully. The trust funds supporting it had, in spite of certain ill-advised investments, been faithfully maintained. The bank had hardly opened its doors, however, when a systematic raid was made on these funds in New York amounting to some $40,000,000 gold. In violation of the fundamental and plain principles of the currency law, the law as to depositories of government funds in New York was so construed as to place these trust funds in the hands of the bank which proceeded to transfer them to Manila and invest them in long time, non-liquid, and doubtful loans. This, be it said, to the shame of the American officials who were responsible for allowing the bank to obtain possession of the funds. The stupidity of the transaction is almost unequalled in the annals of finance. As a result, the currency system later on broke down completely and the government, in a vain attempt to supply gold in New York against which exchange might be sold, diverted other trust funds from their legal usage and besides borrowed large sums from the United States treasury. Herein lies largely the explanation for the necessity of increasing the indebtedness of the islands by some $45,000,000 as provided in recent financial legislation.

Competency of Officials

"COMPETENCY AND TRAINING OF OFFICIALS: After setting forth the high ideals which were impressed upon the bank in the beginning and after noting the fact that the business organizations was designed by a man of rare ability, the examiner proceeds to show how the bank, with its hundreds of millions of assets, came to be officered and manned by men with no training or experience whatever in banking.

"President Concepcion was characterized as an astute politician with only slight tolerance for American or things American, a strong partisan, and not a banker either by training or inclination. During his three years' administration every American but one (a subordinate) was eliminated with the result that there was—'not a trained banker or a man trained in bank detail among them, and these to handle and invest P.300,000,000 of values.' It is beyond comprehension to understand how such a condition could have been allowed to exist. As a result, during the strenuous war and post-war period which brought on unprecedented business and exchange conditions, 'the bank was officered by a president, inexperienced in banking and in the financial world of the white man—unsupported by a single officer or director who had the necessary experience and contact, and manned with a crew of natives—neophytes in the details of the game of banking. It was veritably a 'one man' bank, and that one man was the President, V. Concepcion.'

Unfamiliar with Credits

"Quite naturally, Mr. Coates found the officers unfamiliar with credit considerations as a basis for granting loans. He found that loans were freely granted, in disregard of all credit considerations, as prompted by 'political' or 'national' considerations with the inevitable result that the bank's assets were tied up solidly in non-liquid, capital, and doubtful loans. Not only this, but Mr. Coates found 'extreme procrastination' and carelessness in looking after and protecting the value of assets after they were acquired by the bank. Gross carelessness, to say the least, was evident from the fact that the examiner found loans in the sum of P.8,278,353 with regard to which the bank's records contained no information from which he could judge as to their solvency.

"Referring to the bank's dealings in hemp, after they had been laid before him in detail, Governor-General Harrison said 'It is the most pitiful story I ever heard.' Mr. Coates himself classed it as 'a history of the wildest kind of 'Wild-cat' banking.'

"Contrary to the law, the liabilities of directors of the bank amounted to some P.10,000,000 upon which the examiner estimater losses of about P.3,800,000.

"On the whole, Mr. Coates said there was 'a runaway desire toward inflation and exploitation at the expense of sound banking.' This opinion he reinforced by quoting a cablegram of Acting-Governor Yeater to the secretary of war as follows:—

Governor Yeater's Cable

> In my judgment, the National Bank may be summarized as drifting with an indisciplined crew, without rudder, compass, or captain. The last American leaves this month. The bank needs a manager and heads of departments with banking experience and financial instincts. Stock has declined to 40. Believe bank solvent but merely on faith, without seeing or knowing.

Such was the condition in which Mr. Coates found the bank, and which was made known to the authorities in Washington in the fall of 1920. As above stated this resulted in the bank being placed under new management in the following January.

"Before the new management was installed, however, the republican party had been returned to power in the United States and it was evident that a new administration would be installed in the Philippines. The Wood-Forbes mission was appointed, and one phase of their investigations covered an examination of the Philippine National Bank by the well-known firm of Haskins & Sells. This examination was continued over nearly a year and the final report was received in Manila about June 15, 1922.

Report of Haskins and Sells

"A. PRELIMINARY REPORT: In order to supply information as a working basis for the mission Haskins & Sells rendered a preliminary report under date of June 11, 1921. The results of this preliminary survey revealed the fact that in their judgment the losses of the bank would reach the sum of P.47,000,000. Quoting from their report:—

> It is obvious, therefore, that the investment made by the Philippine government in the capital stock of the Philippine National Bank has been completely lost, while most of the deposits made therein must remain fixed indefinitely. As a result of the condition disclosed reserve (20 per cent. of each) required by law for the protection of the circulation and the demand deposits amount to approximately P.3,000,000, whereas the legal requirement is about P.23,000,000.
>
> Our examination thus far reveals the fact that the bank has operated during almost the entire period of its existence, prior to the appointment of Mr. Wilson as manager, in violation of every principle which prudence, intelligence or even honesty could dictate."

"B. FINAL REPORT:

"1. Losses.—The final report of the examiners summarized the principal losses as follows:

"Loans and Discounts	P.60,889,000
"Exchange operations—Shanghai	13,000,000
"Losses on United States liberty bonds ...	1,200,000
"Total	P.75,089,000

Loans to Directors

"2. Loans to Directors.—After citing the law relating to loans to directors there are listed loans made to interests owned or controlled entirely or in part by directors in the sum of P.7,219,207, of which the sum of P.2,987,789 is estimated as losses.

"3. Sugar Centrals.—With reference to the seven sugar centrals financed by the bank the examiners estimate that they owe the bank something over P.40,000,000, 'of which it is very doubtful whether P.25,000,000 will be recovered. The planters who own these cane lands (mortgaged to the bank), as well as the majority of the shares of the centrals, owe the bank well over P.10,000,000 individually, secured by sugar shipments, lands and personal properties. Advances by the bank from May 19, 1921, up to February, 1922, aggregate about P.3,500,000 for new equipment, off-season expenses, payments to outside creditors, etc.'

"4. Loans to Cocoanut Oil Companies.—Loans outstanding to oil companies at February, 1922, amounted to about P.23,700,000. In addition many loans were made on shares of stock of different oil companies, a number of which are now insolvent. Particular attention is called to the affairs of the Philippine Vegetable Oil as indicating gross incompetence if not almost criminal carelessness. This company, with assets appraised by Haskins & Sells at about P.5,000,000, had borrowed from the bank P.17,251,000, and had incurred additional liabilities to others in the sum of P.13,750,000; total liabilities of P 31,001,000 supported by only P 5,000,000 assets.

Aggregate Liabilities

"The aggregate liabilities of these oil companies amounted to P.51,810,000 as against assets estimated as P.21,000,000, an excess of liabilities of P.30,810,000 over assets. 'The manufacturing costs submitted for the year, 1920, indicate that, at the present price for oil and copra, most of these companies cannot earn sufficient to pay the interest on the bank loans amounting to about P.1,900,000 per annum at 8 per cent., unless radical improvements are effected.'

"This prediction has been fulfilled for, after investing considerable additional funds in the business, the bank, at the present writing, is foreclosing its interests in all oil companies.

"5. SHANGHAI LOSSES.—The exchange losses of the Shanghai branch were incurred prior to 1921. These losses were the result of entirely unnecessary and purely speculative operations in exchange by the manager, Mr. J. W. Miller, a man with no banking experience who, very ill-advisedly, was placed in charge of the branch in Shanghai where other foreign banks place their most experienced exchange bankers.

"The settlement of these operations involved a loss of about P.13,000,000 of which the sum P.3,353,308 had been paid June 30, 1922.

"Details of these transactions were placed in the hands of the United States district attorney for appropriate action but no prosecution resulted because of the inability to get Mr. Miller within the jurisdiction of the court.

"6. GENERAL COMMENTS.—'The foreign department, which operated under the supervision of the Vice-President (M. S. Concepcion), was found to be conducted very inefficiently and dishonestly, necessitating criminal action against the heads of the department. The collection department records were also in bad shape. Many overdue bills had accumulated and as a result of the laxity in the department considerable losses have accrued to the bank. The accounting of the bank generally has been extremely bad. Even where proper records had been devised they were generally carelessly and inaccurately kept. There was no record to show the total liability of any customer, it being necessary to search through the different departments and consolidate the various items. . . . Loans were frequently made by Manila and also by one or more branches to the same customer, making it very difficult to determine the total obligation of any customer.'

Summary of Two Reports

"Solvency—Coates Report:—No definite conclusion is drawn by Mr. Coates as to the solvency of insolvency of the bank as of November 30, 1919. Actually determined losses were sufficient to wipe out the entire surplus and to reduce capital (at that time P.12,980,000) to P.8,479,262. As against this amount of unimpaired capital he places P.24,204,990 doubtful loans, and there evidently was a serious question in his mind as to whether sufficient losses would not develop from these doubtful loans to wipe out the entire capital.

"Solvency—Haskins & Sells Report:—A year and half later, May 19, 1921, Haskins & Sells show aggragate losses of P.75,089,000, while their consolidated balance sheet shows that the bank's liabilities exceed its solvent assets by P.65,903,167. It is evident, therefore, that as the result of five years' operations of the National Bank the entire capital stock of the bank, P.35,300,000 (of which the government owns P.32,000,000), had been lost as well as some P.30,600,000 of its P.60,016,345 (insular) deposits.

"When the additional facts are taken into consideration, (*a*) That the assets of the bank, over and above its losses, must remain indefinitely tied up in frozen loans, (*b*) that the bank's outstanding circulation amounted to P.41,019,701, and (*c*) that the required legal reserves for the protection of this circulation and some P.81,000,000 deposits were deficient by the sum of P.21,985,479, it is clearly evident that the bank is hopelessly insolvent.

Causes Leading to Failure

"In the terse opinion of Haskins & Sells the causes leading to failure were that the bank, during almost the entire period of its existence, was operated 'in violation of every principle which prudence, intelligence, or even honesty could dictate.'

"The opinion of Mr. Coates, while no less emphatic, was based upon an elaborate analysis. Starting under very favorable circumstances, the trained personnel of the bank was rapidly eliminated and the institution soon come to be officered and manned by men without experience or training in banking or in the technical details of procedure. Bad as this was, it was made worse by a lamentable lack of responsibility, by political interference in matters of policy and administration, and by a woeful failure of proper supervision. In fact, the influence leading to failure were those which characterize, in general, the failure, under a democratic regimé, of government banking as well as of other ventures in the field of business where success is dependent upon individual initiative, efficiency, and responsibility. The economic fallacy underlying the failure of the Philippine National Bank is that government funds were lavishly used in feverish speculation in the marketing of products rather than in assisting in their production. Private capital was abundantly able to care for the former but not for the latter.

Revaluation of Assets

"The condition of hopeless insolvency revealed by the Haskins & Sells report indicates the necessity for immediate action. The present situation is fraught with serious danger to the government, especially in view of the bank's large outstanding circulation which it is unable to redeem in lawful money as required by law.

"However, in view of the startling nature of the Haskins & Sells report and in order that we might proceed with a greater degree of assurance, it has been deemed advisable to check their estimate of losses by a reappraisement of the bank's assets. I have, therefore, during the last three months, largely with the assistance of Mr. Leon H. Martin, a trained banker as well as an experienced National Bank examiner, made such a revaluation and the results are given below.

"The revaluation of the assets of the Philippine National Bank was made as of June 30, 1922, or a little over thirteen months after the examination of Haskins & Sells (May 19, 1921).

"The nominal condition of the bank as of June 30, 1922, is reflected in the following consolidated report of the bank which has been condensed from the more detailed official statement of the insular auditor's representative in the bank, Mr. H. S. House:—

CONSOLIDATED STATEMENT OF CONDITION OF THE
PHILIPPINE NATIONAL BANK AS OF JUNE 30, 1922.

ASSETS.

Loans, discounts, overdrafts and Accounts Receivable	...P141,964,793.06
Bonds and other Investments	2,875,993.46
Real Estate, Furniture and Fixtures	1,145,116.75
Reserve Cash	632,152.12
Checks and other Cash Items	546,639.95
Due from Banks	1,858,993.45
Due from sugar shipments	3,710,000.00
Miscellaneous Assets	442,583.86
Profit and Loss (Unrecoverable assets)	14,280,377.03
Total	...P167,456,649.68

LIABILITIES.

Capital Stock Paid up		...P 35,300,000.00
Deposits: Insular Government ...	...P 47.543,913.47	
Prov. and Munc. Govts. ...	... 15,281,820.09	
Individual	... 10,591,120.23	
Time Deposits	... 8,208,422.92	
		81,625,276.70
Circulation outstanding		30,758,230.50
Reserves for taxes, etc.		399,354.52
Cash Letters of Credit outstanding		4,283,535.17
Acceptances outstanding		4,230,828.62
Due to Banks		704,269.77
Due to Branches and Head Office		3,941.662.04
Notes Payable		9,646,692.48
Accounts Payable		630,943.53
Miscellaneous liabilities		135,856.35
Total		...P167,456,649.68

CONTINGENT LIABILITIES.

Accepted time drafts outstanding	350,000.00
Customer's Letters of Credit, outstanding	4,656,935.03
Exchange contracts	2,511,391.20
Items for collection	2,005,252.97
Total	... P 9,523,579.20

"Sommed up briefly the results of the revaluation of the bank's assets show the following condition:—

Acknowledged losses in Profit and Loss Account ...	... P14,280,377.03
Losses on loans to Sugar Centrals	... 14,974,346.49
Losses on loans to Cocoanut Oil Mills	... 14,727,536.46
Losses on Miscellaneous loans	... 16,001,239.66
Losses at various Branches, estimated	... 2,000,000.00
Losses on Miscellaneous Assets	... 1,108,138.82
Total losses	... P63,091,638.46
Very slow loans	... 11,659,016.38
Doubtful loans	... 4,683,562.07
Long time loans	... 6,141,759.10
Loans on which no interest is charged P22,155,000 ...	...
Assets unquestioned at present time	... 81,880,673.67
Total Books Assets	...P167,456,649.68

Entire Investment Lost

"In order to make the above estimate of losses (P63,091,638) comparable with the estimate of Haskins & Sells there must be added the losses written off by the bank between May 19,1921 and June 30, 1922 from reserves carried on the bank's books as of the former date. This makes a total of estimated and actual losses of P63,091,638 plus P11,600,000 or P74,091,000 as of June 30, 1922, as compared with P75,089,000 losses estimated by Haskins and Sells as of May 19,1921.

"In other words the government has lost its entire investment in the capital stock of the bank as well as about 60 per cent. of its deposits remaining in the bank.

"Considering the remainder of the assets, after losses are deducted, it will be noted that P11,659,016.38 are closed as particularly slow and difficult of working out, P4,683,562.07 are closed as of doubtful value, upon which considerable losses will no doubt accrue, while P6,141,759.10 are classed as long time loans. This latter amount represents loans secured by real estate, probably of sufficient value to liquidate the loans if purchasers could be found, which is, of course, very improbably. If these loans could be amortized over a period of 20 to 30 years and carefully watched it is probable that the larger part could be realized upon.

"The fixed character of the bank's loans is further emphasized by the fact that there are loans in the amount of P22,155,000 upon which the bank is charging no interest. This of itself represents, at 8 per cent., an annual loss of P1,772,000.

Legal Reserves Gone

"As a further indication of the non-liquid condition of the bank, it is to be noted that on June 30, 1922, the bank should have held legal reserves of P12,229,719 against its P30,758,230 circulating notes and P81,625,276 deposits. In actual fact it held a lawful reserve of only P182,022, or a deficiency of P12,047,696.

"Under the conditions as above revealed there is only one conclusion to be drawn, viz., that the Philippine National Bank is hopelessly insolvent.

"In making the above reappraisement of the bank's assets, the examiners have been very conservative, and have based their judgment upon all the information available. In this connection it should be stated that experience in examining the other Manila banks has thrown much light upon the condition of the loans of the National Bank which has never before been available. They do not claim that their judgment is infallible. However, the fact that the results of the reappraisement of the bank's assets are practically confirmed by the estimate made by Haskins & Sells as the result of nearly a year's investgation on their part, leads to the belief that we have arrived at conclusion upon which it is safe to proceed.

Recent Operations of Bank

"The Coates report was not conclusive as to insolvency, but upon the facts revealed the bank was placed under the management of an experienced American banker with an advisory corps of four Americans trained in banking practice. The new regime entered upon its duties believing that it was possible to rehabilitate the bank. The administration has been reorganized, undesirable personnel has been eliminated and several persons convicted of criminal offenses. The bank's securities have been put in better shape and new securities taken where possible. These efforts have undoubtedly resulted in saving the government considerable money.

Early the process, February, 1921, the government attempted to strengthen the position of the bank by increasing its capital to P35,300,000, but as the capital account was increased by a book entry transferring government deposits (P23,082,860) to capital, no actual relief was thus obtained save in the interest which the bank would otherwise have paid on the deposits so transferred.

"In order to meet the demands of the government for the return of its deposits and in order that the bank might advance large sums to the sugar centrals, sugar planters and oil interests, the liquid loans of the bank have been collected, its United States bonds largely sold, its cash holdings, reduced to an unsafe minimum, balances due from other banks called in, and its circulation increased. As far as these funds were returned to the government this use was justified. The use of such funds, however, in an attempt to improve the condition of seriously involved debtors, has, I am convinced, not been justified and I do not believe the bank's position on the whole has been strengthened by thus "throwing good money after bad."

Bled Dry of Assets

"The net result of the policy pursued is that, between the urgent demands of the government for the return of its deposits and the demands of the sugar, oil and other interests, the bank has been bled dry of its liquid assets, practically no reserves are held in support of its P32,000,000 circulation and its P81,500,000 deposits, while the assets remaining to be liquidated are tied up solidly—frozen. It is very questionable whether the bank, in the future, will be able to meet the requirement of the government for a sufficient sum annually to compensate the government for the interest and sinking funds on the bonds it has recently been forced to issue because of the former mismanagement of the bank. However, should it be so fortunate as to be able to do this, it would be so depleted of funds that it could transact no business with the general public.

"Government necessity, and the policy of the management in reinvesting proceeds of liquidation in the hope of 'working out' its frozen assets, together with its tremendous losses, have brought about a condition under which the bank is now operating at a loss in doing practically nothing but financing the affairs of debtors who are themselves in various stages of insolvency. This in spite of the fact that the bank has been operating with the financial advantage of having to maintain no reserve (required about P.12,000,000), an advantage of about P.720,000 per annum.

Interest of Debtors

"In spite of the painstaking effort which have been made to remedy its affairs in the last two years the position of the bank has thus become day by day more hopeless. It has been impossible to overcome the damage wrought by former management, and the bank to-day is laboring under the false pretense of doing business with the public, whereas its business is almost entirely confined to the interests of its debtors who persistently ask that they be indefinitely financed by government funds while the government is forced to curtail its legitimate and vital necessities because of the lack of funds thus used. The ever present and inevitable protest and outcry of the debtors class against a policy of daflation (liquidation) has materially retarded the process. These debtors have persistently urged, and are largely responsible for such feeling as exists, that the bank must be kept indefinitely in business. Obviously, as a class, they are demonstrated 'failures' in the field of business. It was only through sheer ignorance of banking principles that they were set up in business in the first place with government funds and it is little less than criminal to continue them in business with government funds when the health and sanitation of the people of the islands is seriously suffering because of such use of funds.

"It is very apparent, therefore, that nothing is to be gained by keeping up the false pretense of doing a banking business with the public, and this at a loss. As a matter of fact the bank, at the present time, is not functioning as a bank but rather as an organization devoted almost exclusively to handling the affairs of a large number of more or less insolvent business concerns and individuals. There is thus nothing which cannot be gained by closing it to the public and converting it into a special corporation for the gradual liquidation of its frozen assets. The government would, in this manner, not be put in the false and vicious position of maintaining one standard of business law and ethics for its own institution while at the same time forcing another higher and more rigid standard upon private business. Not only is the present position of the government unjust in this respect but I am also convinced that the courts would hold it to be illegal. The present attitude of the government toward the bank is now being made use of to discourage the coming of much needed capital to the islands. I know of no argument more potent in this respect.

The Problem of the Bank

"The bank has been legally and morally dead for at least two years though it has been necessary to inject into its palsied body a semblance of life on account of its and the government's inability to repay the immense loan from the people in the form of its outstanding circulation (now about P.32,000,000) as well as to restore individual deposits in the approximate sum of P.15,800,000, and provincial and municipal deposits in the sum of P.18,281,000.

"Summarized briefly, as of June 30, 1922, the government is confronted with a National bank, of whose stock it owns approximately 92 per cent., in the following conditions:—

(*a*) Its capital of P.35,300,000 entirely wiped out by losses and with assets insufficient to meet its remaining liabilities by P.27,791,638.

(*b*) An outstanding circulation of some P.32,000,000, representing a loan from the people, protected by practically no legal or other cash reserves, and which can only be redeemed by the slow liquidation of frozen assets.

(*c*) Deposits due to the insular government in the sum of P.47,543,000 due to provinces and municipalities in the sum of P.18,281,000, and due to individuals in the sum of P.15,800,000; a total of P.81,625,000, protected by practically no legal or other cash reserves, and which can only be repaid by slow liquidation of frozen assets.

(*Note.*—The above distribution of deposits is based upon more recent reports than those of June 30, 1922).

(*d*) A bank which, by its inability to be of service, has been deserted by practically all customers, whose business is worth while, and consequently

(*e*) A bank serving practically none but those whose business is seriously involved or verging upon or actually bankrupt.

(*f*) A bank whose liquid assets have been collected, and whose remaining assets are invested in long time, non-liquid, and capital loans which must remain so fixed for an indefinite period.

(*g*) A bank, practically owned by the government, operating at an actual loss in accordance with the auditor's report for September 30, 1922, and in open flagrant violation of the law which it forces privately capitalized banks to observe.

(*h*) A bank whose reputation, as far as the outside world is concerned, is irretrievably lost.

(*i*) A bank whose entire history, from the day of its opening down to the present time, has been a conclusive demonstration of the fallacy of the government entering a business which is abundantly financed by private capital and efficiently conducted.

Receivership Justified

"Obviously a private bank in such a condition would have been placed in the hands of a receiver for immediate liquidation as soon as the fact were known. As a matter of fact the government has had ample evidence for taking such action since July, 1921. This evidence was made conclusive by the final report of Haskins & Sells in June, 1922, and still further confirmed by a careful reappraisement of assets made as of June 30, 1922.

"Unpleasant and as unfortunate as it may be, it is well to squarely face the demonstrated fact that a government owned and operated bank has been a complete failure for which both Americans and Filipinos have been responsible. I have no hesitancy, therefore, in recommending that the bank be closed to the public as soon as proper provision can be made for the repayment of individual, provincial and municipal deposits, for the protection of its outstanding circulation, for the proper administration of relief to agriculture, and that the bank be transformed into a special corporation whose operations shall be confined to handling the affairs of all debtor corporations, firms, and individuals in such manner as will result in the greatest returns to the government and the least disturbance to business conditions. This would enable its affairs to be liquidated as a going concern, remove the many present elements of danger, and place the government square with the world.

"In confirmation of this position I desire to quote the very pertinent opinion of Mr. Robert L. Herrick who, at your request, was sent out here to make a careful investigation of government finances. Mr. Herrick, as you are aware, is one of the most eminent financial and banking authorities in the great eastern financial centre of the United States; a man with long and successful experience in rehabilitating the affairs of some of the largest American corporation. He gives his opinion as follows:

Herrick's Opinion

> "This bank, I think, should be liquidated. If it is made strong again by putting government money in it, it will become weak again, as a result of injudicious loans. I do not believe it possible to run it under government management, and run it well and safely as a bank. This is not because I particularly distrust Philippine management for I assume exactly the same thing would take place here (United States) if we started a government bank. Unavoidably, with government management and more or less political influence, or indifference or lack of competence on the part of managers appointed by the government, such a bank would absorb all of the dead loans of the surrounding country, and the other banks would do their best to help such absorption by leading their unsatisfactory customers right over to the doot of the new bank. Such a thing would happen here and all over the world, and surely it must happen in the Philippines.
>
> "With regard to restricting its functions and then keeping it alive, I believe the answer is that all the good it could do with restricted functions can be accomplished in some other awy, and that it would be difficult to keep it on a restricted basis, and it is much safer to get rid of it finally winding it up."

Closing the Bank

"I am well aware of the justifiable feeling of the Filipino people that they should have a bank distinctly their own. Other nationalities have banks catering to their particular needs. There is no valid reason why Filipinos likewise should not have a bank of their own. But, in view of the unfortunate and inevitable failure of the National bank, it should, like the banks of other nationalities, be a private bank. If the Filipino people are ever to achieve financial success they must cease to lean upon a paternalistic government, and clearly recognize the almost universally demonstrated fact that the people, through the agency of government, cannot accomplish collectively, in the affairs of business, that which they cannot accomplish individually through their own initiative and ability.

"I have great confidence in the latent ability of the Filipino people to transact an increasingly larger part of their own business. But progress must necessarily be slow in view of the fact that, in entering the new world of business, they must match their wits against the keenest minded men of a business world of age long training. This subject will be referred to later.

"The closing of the bank requires the careful consideration of many important factors.

Limitation of Banking Facilities

"It is the general opinion among bankers and business men, and borne out by statistics, that the banking facilities of the islands, aside from the National bank, are far in excess of needs. In fact it hardly seems possible that there is sufficient business to make possible the successful operation of the present banks. The closing of the National bank would, therefore, deprive no one of ample banking facilities.

"In fact, in the light of experience, the islands would have been infinitely better off without such facilities as have been supplied by the National bank. Further, the bank in its present condition is unable to finance any but those heavily indefied to it and even these on a very limited scale. Nearly every customer whose business is worth while has been forced to transfer his business to other banks, and the bank has been left with a very undesirable residuum.

Provision for Paying Depositors

"There are at the present writing (October 20, 1922), approximately P.11,722,000 of individual depOsits, and arrangements must be made for their payment in full before the bank can be closed.

"In addition the bank holds deposits of provinces and municipalities in the approximate sum of P.19,192,000. These deposits represent the working balances of these organizations. Should the bank be transformed into a special corporation as above recommended, such corporation could be allowed to continue to handle the funds of provinces and municipalities until such time as the proceeds of liquidation would enable it to repay these deposits in full.

"There remains to be considered the provision for paying individual depositors. The most feasable method of raising funds for this purpose would be the sale of the bank's interests in the sugar centrals and various oil companies.

"First, as to the Sugar Centrals.—On June 30, 1922, the centrals owed the bank approximately P.43,500,000. Without going into the details of costs of production, overhead expenses, volume of product, etc. (for which see former reports), it is plainly evident that the centrals, under government management and control, and on the probable average price of sugar, will not be able to do more than meet their current expenses including upkeep, depreciation and interest. Indeed they will be exceedingly fortunate to be able to do even this much. It is a well known fact that, under private ownership with a much lower capitalization, with the most skillful management individual initiative can provide, sugar centrals can, with difficulty, keep their capital investment intact and earn an average yearly net return of say 6 per cent. How, then, under the universally recognized handicap of government ownership, with a capitalization at least 40 per cent. greater than normal, can the centrals be expected to do more than, or even as much as, privately owned centrals ?

Unheard of Feat

"If the sugar centrals, then, will be fortunate in being able to provide for up-keep and to meet annual interest charges, what hope is there that they will in addition be able to repay the bank their entire capitalization. Such a feat is practically unknown in the annals of private finance, to say nothing of government operated enterprises.

"Even if the Centrals could accomplish the unheard of feat, say in twenty-five years, it would be infinitely better to sell them on a fifty per cent. basis for cash, for the amount realized would be worth much more to the government now than the full amount in twenty-five years ; to say nothing of the vicissitudes and uncertainties of the government being involved in the sugar business all this time.

"Neither can it be expected that the sugar planters will be able, out of their profits, to purchase the centrals. At least they cannot do this until they have first paidtheir present heavy obligations to the bank, estimated at approximately P.15,000,000. Judging from past experience this latter will be an exceedingly slow process.

"Under these conditions the obvious thing to do is to sell the centrals to private interests. I am convinced that this can be done, and under conditions much more favorable to the planters themselves. Under present arrangements the planters must pay the bank the entire amount owed the bank by the centrals P.43,500,000, and until it were paid their farms would be under mortgages to the bank. Under a proposed sale to private interests the planters would be freed at once from their mortgages and would be able to repurchase the centrals, if they so desired, at the price paid for them by private interests, say P.22,000,000, plus the necessary capital additions made in the meantime, or say P.25,000,000, as compared with the P.43,500,000 they will have to pay under present arrangements.

"Second, as to the Oil Interests.—These were, on June 30, 1922, indebted to the bank in the sum of P.24,727,536 as compared with P.23,710,000 of May 19, 1921. The increase represents an ineffectual effort to "work-out the oil indebtedness. The bank's entire interests in oil should be sold for what they will bring for actual cash. Under no conditions should the government be put in the position of assuming the ultimate risk by permitting any one to supply the working capital in an attempt "work-out" the proposition by which the experimentors would come to own the properties if successful while the government would gain become the owner if the process were unsuccessful.

"I believe the bank would be fortunate to receive P.10,000,000 in cash for its present interest of approximately P.24,000,000.

"If a sale of the sugar and oil interests as above indicated could be affected, the net returns, some P.32,000,000, would enable individual, provincial, and municipal depositors to be paid in full.

Provision for Circulation

"Again the bank cannot be closed without some satisfactory provision for its P.32,000,000 circulation. This could be effected by the legislature guaranteeing the ultimate redemption of the notes. If they circulate freely now with the bank in its present condition they would circulate equally as freely with the added guaranty of the government behind them. The notes should be redeemed as rapidly as possible from the proceeds of liquidation as, unsupported by reserves, they are a constant menace to business stability and the operation of our currency system. For instance :

"If the government should be forced to sell say, $12,000,000 exchange before the balance of trade turned in our favor, the treasury certificates in circulation would be reduced to such a point that the banks would find it impossible to keep their resources in such certificates. The result would be that reserves would have to be kept in bank notes, which, being unredeemable in money of intrinsic value, would be merely a paper reserve, and our entire business structure would thus come to rest upon a fixtitious paper reserve, than which nothing could be more dangerous.

Danger to Business Conditions

"The winding up of the affairs of an institution of such wide ramifications must inevitably work a hardship upon some people. However, if the bank were converted into a special corporation, as recommended, no greater hardship would be worked upon anybody than if the bank continued the same process. The severity of liquidation could be gaged, as at present, in such a manner as to prevent any undue disturbance to business conditions in general.

"The payment of depositors in full and the guaranteeing of the redemption of the bank's circulation would prevent any ill-effects upon their banks.

"With the present banks competing eagerly for business, it is evident that every business man, regardless of his nationality, can obtain at the present time banking facilities for a sound bankable proposition. Other banks should not be criticized for turning down such propositions as were formerly acceptable to the Philippine National Bank and which brought about its downfall. However, if Filipino business men feel that they should have their own banking institution there is no valid reason against it. But, as before stated, it should be a purely private institution. It would not require a large capital. I believe a capital of P.1,000,000 would be ample for some years to come, and that this, with such deposits as it would obtain, would be ample to finance Filipino business men. They, as well as others, have leaned upon a 'broken reed' in the past. It is time for them to throw away crutches and stand on their own feet if they ever expect to handle any large share of their own business.

Provision for Agricultural Relief

"The closing of the bank will make necessary the establishing of an institution to promote agriculture. In fact the urgent needs of agriculture demand the establishment of such an institution at the earliest possible date regardless of the ultimate disposition of the Philippine National Bank. The continuance of the National Bank for this purpose is out of the question.

"First, because agricultural relief is dependent upon securing large sums of long time money through the sale of farm loan bonds, and it would be absolutely impossible to float bonds in the United States over the name of the National Bank whose reputation is irretrievably lost.

"Second, though no further argument is necessary, I am fully convinced from the results of careful examination of branches of the bank in favored localities that the bank's efforts to assist agriculture have, as a whole, been more of a detriment than a benefit to the real interests of the farming community, and that it has created obstacles in the way of well considered scientific relief to agriculture which it cannot overcome itself and which will seriously handicap legitimate relief for some time to come. The whole atmosphere of the bank since its foundation has been one of the exceeding laxness, indifference, and carelessness in granting loans to farmers, in watching to see that the funds were not used for illegitimate purposes, and in inculcating a sense of responsibility for the prompt meeting of obligations. The personnel of the bank is so permeated with such false ideals that it would not only be useless but also dangerous in administrating scientific relief to agriculture. The new institution should be entirely free from these dangers as well as from any connection with the unpleasant details inevitably connected with the liquidation of many ill-considered agricultural loans.

Agricultural Bank

"I have, therefore, prepared, with the valuable assistance of the secretary of agriculture and natural resources and already submitted to you, a bill for the establishment of such an institution embodying the best features of similar successful institutions in other countries, adjusted to meet local customs and conventions.

"It is very probable it may be urged in opposition that this is another government venture in the field of business. It must be remembered, however, that this is a field which is not covered by private capital. Early in 1904, I assisted in the preparation of a bill for an agricultural bank in the Philippine Islands which was based upon the idea of encouraging private capital to undertake this function by guaranteeing a minimum net return to such capital. The attempt resulted in failure. Nearly every other progressive country has found the establishment of a government institution for this purpose necessary. Even the United States, where government ventures in business have been particularly unfortunate, has found it necessary to assist agriculture through the establishment of a federal farm loan system.

"I trust this bill will meet with your favorable consideration and that it may be transmitted to the present legislature with your recommendation for its prompt enactment into law.

When Shall the Bank be Closed

"As before stated it cannot be closed until provision is made for the payment of individual depositors in full. The sale of the sugar centrals and oil interests would provide the funds for this purpose, but though tentative negotiations are now under way it will take considerable time to arrive at and effect a satisfactory sale.

"In the meantime it will be necessary for the bank to continue in business on a restricted basis. In my judgment, however, it would be a very serious mistake to continue it in business for a longer time than is necessary to determine whether the sugar centrals and oil interests can be sold. At that time, if the central and oil interests have not been or cannot be sold, the special gold reserve which the government holds for emergencies should be used to repay depositors, the bank definitely closed to the public as a going concern, and converted into a special corporation as above recommended.

"In presenting the above analysis of the situation I have had in mind solely what I consider to be the best and permanent interests of the Filipino people. My conclusions have been reached without reference to considerations of personalities or national pride. Under all conditions, it is best to know the truth and to be guided by its application.

"Respectfully submitted,

"(Sgd.) BEN F. WRIGHT,

"Special Bank Examiner.

"Manila, November 20, 1922."

30,000,000 Cigarettes Daily

The Nanyang Brothers Tobacco Company

AN example of what Chinese industry and enterprise can achieve is furnished by the success of the Nanyang Brothers Tobacco Company, which last year paid dividends amounting to fourteen per cent. on nominal shares of $20.

Less than eighteen years ago, says the *Hongkong Telegraph*, the Company was started in a small way in the colony. To-day it has assumed the position of China's biggest native purveyors of tobacco products, with funds and property swollen to well near $20,000,000. The dividend it paid out to shareholders last year was $3.20, and there are expectations of an even greater return this year, increased costs of production and labor notwithstanding.

This remarkable development of what has become one of the colony's chief industries is viewed as a phenomenon by those who recall the circumstances which saw the starting of the Company eighteen years ago. The difficulties usually besetting the path of the pioneer enterprise included in the case of Nanyang Brothers competition against companies which had already established a firm market for their products in China. The history of Nanyang Tobacco Co. in this connection is like those of other pioneer undertakings. It had its ups and downs, but, once established on a sound business foundation which came with experience, success was assured.

When in 1908 the small concern that operated a factory on the Wanchai Praya failed for the second time as a limited company, the shareholders then already drawn for the second time into an expenditure of $100,000 on the industry and receiving none of the promised profits, resolved on a complete winding-up, and in due course the machinery and property was put up for public auction. It was then that the Nanyang Brothers did a remarkable thing. They bought the machinery for what it was worth—which was very little in that period of depression—and proceeded to give another instance of that optimism which was to carry them through to the gaol desired.

Uncle Kan Ning-shek, who was blessed with ample wealth, allowed himself to be infected with the optimism of his nephews (Kan Chiu-nan and Kan Yuk-lee) to the extent that he cheerfully put up the new capital required to place the concern on a sound business footing. Investigating the causes of the previous failures, it was discovered that what was really behind it all was the standard of the products manufactured. These were in quality far behind those put on the market by competitors. It was towards remedying this defect that the two brothers now concentrated their efforts. Native tobacco, such as grown in North China where the raw material was principally secured, lacked the flavor demanded by consumers. It was necessary to improve the flavor by blending with other growths, and an agreeable mixture was achieved by the introduction of a small percentage of Virginia leaf. A system of buying, and distribution of sales was organized; and, backed by an increased output made possible with new and improved machinery, the Nanyang Brothers Tobacco Company, really originating with the old Canton Nanyang Brothers Tobacco Company, slowly but surely pushed forward its business, gaining, with the improved quality of its products, the favor of the Chinese smoker, and thus a firm place amongst the four hundred millions of China's population.

For the Kan family, the business had now become a sound investment, and the co-operation of a third brother had to be secured. He came from Saigon in 1916 and joined the family directorate which had by this time been reinforced by a fourth member, Kam Hong-chin, a son of that benevolent uncle who had so kindly come to the rescue when the fortunes of the brothers were at low ebb. The partners had to be content at first with small profits on a limited output, and the real progress from a dividend point of view can be said to commence from the reorganization of the Company from a private family concern into a public limited liability company.

The plant in 1919 had produced a daily output of four million cigarettes and was on the way to producing more when the brothers found themselves up against a proposition. The effects of the anti-Japanese boycott were felt by almost every Chinese merchant of any good standing. In the case of the Nanyang Brothers these had taken the form of a mischievous rumor that the controlling interest in the Company was in the hands of Japanese. How this damaging assertion could originate only those who took the trouble to examine closely into the psychological side of the movement could give an explanation. At any rate, dependant as the Nanyang Brothers were on the goodwill of their large army of Chinese customers for the promotion of their business, such a report could not be ignored. So in due course the Chinese public were invited to look into the articles of association and subscribe, according to their means, to the new public limited liability company of Nanyang Brothers.

Since 1920, the Company has prospered exceedingly under its new status. With the growth of business the necessity was felt of having a factory established also in Shanghai, and though this branch started out very late in the day, its output is already double that turned out by the factories at Wanchai. The combined output per day amounted to 30,000,000 cigarettes. This is a good figure, and, considering that all the plants are being kept working at full pressure, it must be realized that the demand for Nanyang Brothers' products is growing.

The Wing Fat Printing Company a couple of years back was started as a subsidiary company for the printing and making up of packages for the dozen or so different brands of smokes manufactured by the Nanyang Company. In line with this progressive tendency was the establishment of a factory at Causeway Bay for the manufacture of tins. This now turns out 10,000 pieces a day and, incidentally, gives employment to nearly a thousand hands. The Company had also acquired some 50,000 square feet of land situated at the Bowrington Canal for an extension of their present plant. Work at putting together the new buildings will commence shortly and when these are completed the tin factory will be removed to this new location. Property values since the boom commenced have increased the assets of the Company and it is now estimated that the Company holds property and funds amounting in value to $20,000,000. In line with the progress of the concern, the amount of dividends paid out at each end of the financial year has steadily increased. At one time the value of Nanyang Tobacco shares rose to as much as $45, on a par value of $20.

The Testing of Railway Couplings

MESSRS. W. & T. Avery, Ltd., at their Birmingham works have just completed a large impact testing machine for the purpose of testing railway screw couplings, three link wagon couplings and draw bars, by impact. The machine, which has been specially constructed for The Alipore Test House, Calcutta, follows largely on similar lines to the machine installed at the National Physical Laboratory, Teddington, Middlesex, for a like purpose, although several improvements in the details of the machine have been made where thought desirable.

Figure 1 shows the general arrangement of the machine, while Figure 2 gives a view down the centre of the machine, showing the coupling in position ready for the test. The friction brake described later is also shown, also the striking buffers on the pendulum hammer.

It will be seen from the illustrations that the machine consists of a pendulum hammer and a suspended anvil, both of which are carried upon ball-bearings mounted upon one common shaft, the whole being supported within a large double sided frame built up of rolled steel sections.

The pendulum hammer weighs 2 tons and is raised to a maximum height of 2½-ft. The full maximum capacity of the machine is thus equal to 5-ft.-tons. The raising of the pendulum from its vertical position is effected through the medium of a motor-driven winch. The suspended anvil weighs 4½ tons and is a "U" shaped casting through which the pendulum hammer can swing quite freely. The coupling under test is connected at one end to a central screw upon the anvil and at the other it is attached to a steel crossbridge which is provided with two hardened steel buffers. This crossbridge is carried upon the anvil by means of a hinged bracket which is provided with two straining screws by which an initial load of 1 ton is applied to the coupling prior to the test.

A special feature of the machine is the friction brake which is connected to the anvil. This brake consists of two flat steel reins which pass between strips of "Ferodo" material. By the side adjustment of a series of steel coil springs the friction of the brake can be so adjusted that it will give the maximum frictional resistance of 12 tons. The pendulum hammer is provided with two steel buffer faces, which, on the downward spring of the pendulum, strike against the buffers of the above-mentioned crossbridge, thus applying an impact-tensile test to the coupling. The energy of the blow is partly absorbed by the friction brake and the suspended anvil respectively, the remainder being taken up by the coupling itself.

In the event of the coupling breaking under the blow the pendulum hammer will swing past the vertical and will travel up two circular tracks which are fitted with teeth. Two spring pawls upon the hammer fall into these teeth when the pendulum comes to rest and so prevents its return.

The machine complies with the conditions laid down by The India Office for the testing of couplings, in which, particular consideration is given to the fact that the coupling must withstand without fracture, three blows of 5-ft.-tons, and must not exceed certain limits laid down as regards extension and deformation. On the completion of the machine careful calibration tests were carried out at Messrs. Avery's works and a number of couplings subjected to test.

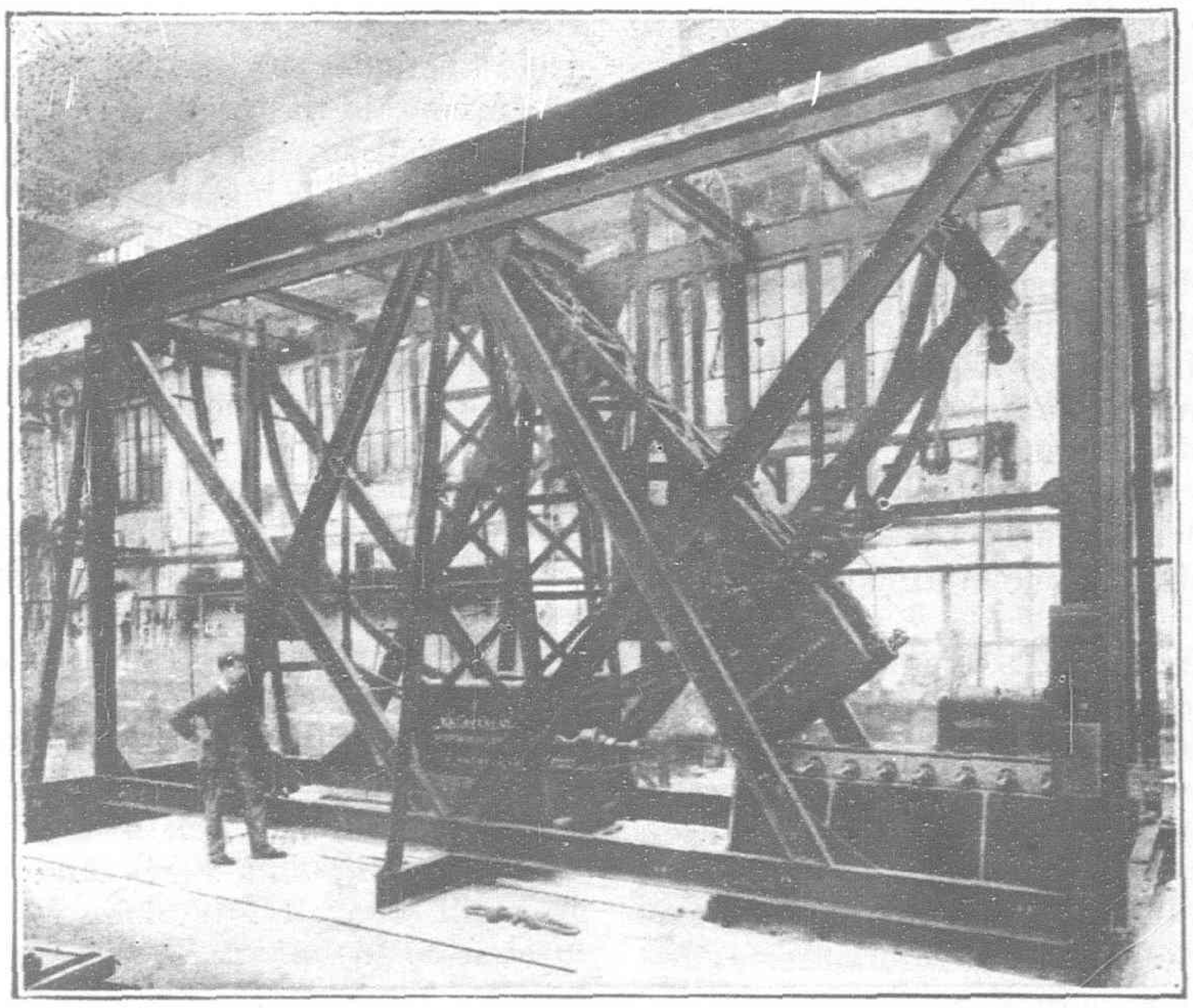

Fig. 1

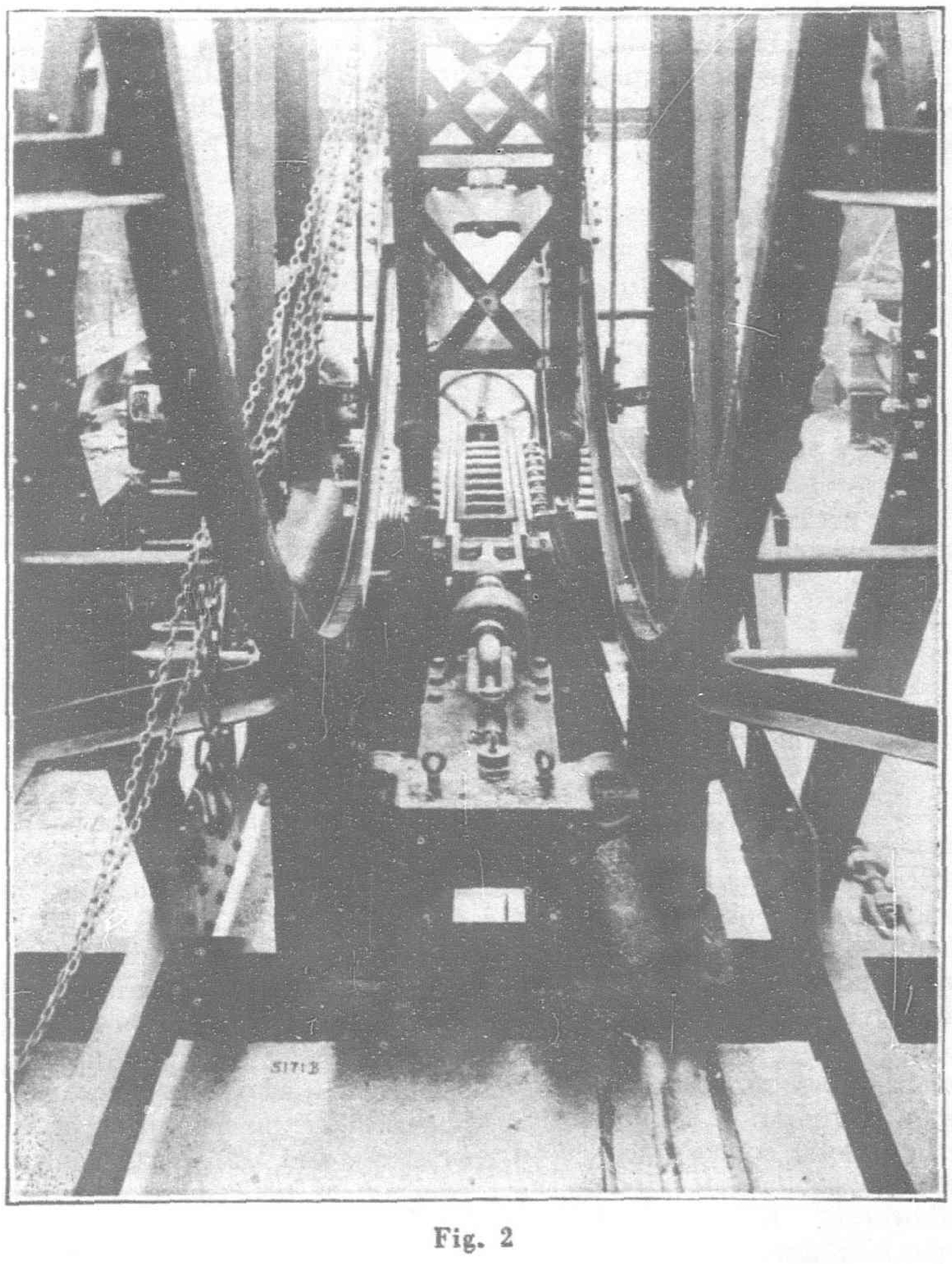

Fig. 2

Rails and Sleepers Laid Over 1 Mile a Day

THE extension work on the Taonan line beyond Chengchiatun has progressed about 53 miles. For the preparation of the road-bed, about 3,500 coolies are employed. This rapid progress is principally due to the use of a rail-laying machine, the first of its kind imported from America, which is worked by a gang of about 500 coolies for laying sleepers and rails. This new machine may be employed with advantage in an expanse of level plain, such as lies on the Taonan Railway route. By this means, a track of 1 mile or 1⅓ miles a day may be laid. It is the first machine of this type ever brought to play in railway construction, in which the Japanese have been concerned.

The officials of the S.M.R. Co. and the East Asia Enterprise Company, who are connected with the construction work, live inside some thirty goods-cars, moving forward as the work advances. The construction of the 141 mile section from Chengchiatun to Taonan is expected to be finished in October, and the same section will be opened to train operation by the end of that month. As regards the new station buildings along the section (the number of the stations being 14 or so), they will take the remainder of the current year to complete.

Forests in the Basin of the Ussuri River

By *Ivan Booshkoff*

THE basin of the river Ussuri, within the Russian territory, extends from the western slopes of the Sikhot-Alin range in the east and the plains of the Hanka lake district in the south to the borders of China (Manchuria) in the west and the Amur river in the north. The total area is 14 to 15 millions dessiatines. The river Ussuri is formed from the confluence of the rivers Ulakhe and Daubikhe, the sources of which take their origin in the eastern branches of the southern corner of Sikhot-Alin. The length of the Ussuri from the confluence of the two rivers is about 500 versts. The tributaries of the Ussuri river from the west are the rivers Sungachi, coming from the lake Hanka, then follow Iman, Bikin, Podkhorenok, Hor, Kia, and a few other rivers. Iman is about 350 versts long, Bikin about 400 and Hor about 350 versts.

The basin of the Ussuri river is in a mountainous country. In the northern part of the basin, from the Amur to the confluence of the rivers Ulakhe and Daubikhe representing to total area of 8 to 9 millions dessiatines, about 68 per cent. of the area is mountainous country and 32 per cent. are plains. The basins of the rivers Ulakhe and Daubikhe is still more mountainous and there the proportion is 82 per cent. of mountainous country to 18 per cent. of plains, principally river basins. The total area of this part is about 3.5 millions dessiatines. The southern part of the basin with an area of 2 millions dessiatines is a plain, the mountainous part being only 20 per cent. of the area.

A considerable part of the Ussuri basin is covered with forests. An exception is found in the basin of lake Hanka which resembles Russian steppes. The rest of the area is of a mountainous nature 45 to 50 per cent. of which is covered with forests. The nature of forests in that country entirely depends on the soil which, owing to the mountainous nature of the Ussuri basin, offers a large variety of species. It is seldom that one meets large areas covered with one specie only, in most instances the specie follow one another as the soil changes. Abietic species are predominating, though in the southern part leafy species are common. This is especially noticeable in densely populated districts or where forest fires have occurred, there abietic species are substituted by such leafy species as birch, aspen, poplar, etc. The abietic species in the basin of the rivers Ulakhe and Daubikhe are cedar, fir, then spruce and a small proportion of larch-tree. The leafy species are oak, white birch, elm, black poplar, aspen, ash, maple, and then velvet oak, walnut, acacia, etc.

In the northern part, fir predominates. Cedar comes next in quantity followed by larch-tree. Leafy species are scarce and only oak, and black and white alder are occasionally met with. Cedar undoubtedly yields the best building material, then follows fir and spruce. Larch-tree is excellent for railways sleepers, props, piles, etc.

The construction of the Ussuri Railway resulted in the destruction of a large portion of forests mainly along the railway line and in the vicinity of villages and towns.

According to surveys made during the period from 1912 to 1917 the following areas of state-owned forests existed in the basin of the Ussuri :—

District.		Surveyed Forests		Total Area	
Lower-Ussuri	...	314,000	dessiatines	314,000	dessiatines
Iman ...	...	855,000	,,	4,500,000	,,
Habarovsk	...	375,000	,,	2,280,000	,,
Total ...	...	1,544,000	,,	7,094,000	,,

These figures should not be considered as final since in both instances they include such areas where the forests had been destroyed by fire, or covered with young growths, or forests of low commercial value. On the other hand, only those forests were surveyed which are situated near rivers and easily accessible. On the whole one must take the commercial value of these forests to be lower than given in the above table.

Timber for local requirements is either cut on lots assigned to peasants' communities, or *by special permission* from state-owned lots. Export timber is cut in special concessions leased by auction. The greater part of these concessions is situated on the rivers Iman, Bikin, Hor, and their tributaries. In these parts, one meets with stretches in which cedar predominates. The forests in that part of the Ussuri basin may be divided into the following groups :—

(1) Lots covered exclusively with cedar with trees 130-150-200 years old with excellent timber yielding at least 60 cub. sazhen,[*] 80 per cent. of which is first-class building materials.

(2) Growths of cedar 130 to 170 years old with a certain proportion of fir 100 to 150 years old. This proportion varies from 3 to 5 per cent. per dessiatine. About 70 per cent. of this *timber is suitable for* building purposes. The reserves are up to 50 cub. sazhen per dessiatine.

(3) This group includes so-called double-deck growths of cedar: A forest with cedars from 150 to 200 years old has an undergrowth of cedars 50 to 80 years old. At least 80 per cent. of such timber is first class building material. A dessiatine would yield about 60 cub. sazhen. If conditions for the growth of cedar are favorable the trunks are quite straight and often a single tree would yield two logs 21 feet long each (standard Russian length), the thinner log being at least 14 to 18 inches in diameter at the upper end.

Growths of fir, covering sometimes considerable areas are found in valleys of rivers. The average age of this specie is between 100 and 150 years and the reserve about 50 cub. sazhen per dessiatine. Larch-tree is found in considerable quantities in the Bikin and Hor river valleys including their tributaries. The average age of the trees is from 100 to 150 years and the reserve about 50 cub. sazhen per dessiatine. The trunks are straight and some trees reach the height of 120 feet with a diameter of 35 inches at the height of 4 feet from the ground.

Among leafy species attention should be called to ash which is met with in growths of mature age—100 to 150 years. Some trees reach the height of 105 feet. The reserves are up to 70 cub. sazhen per dessiatine. Or sometimes ash is met with in connection with aspen and birch. Ash is met with in the valleys of the rivers Ussuri, Iman, and Bikin and of their tributaries. White birch grows in separate lots along valleys of rivers. The average age of birch is 80 to 100 years, with an average reserve of 40 cubic sazhen to the dessiatine. The height of birch in these parts is satisfactory and the trunks are clean and straight. The second type of growths of birch is in small patches with a reserve of up to 70 cub. sazhen per dessiatine. Aspen is met with everywhere in large quantities, though the best growths are along the Svianginsky branch line of the Ussuri Railway and along the rivers Daubikhe and Ulakhe. Trees 120 feet tall are often met with. The average age of aspen there is about 80 to 100 years with a reserve of up to 60 cub. sazhen per dessiatine. Other leafy species are oak, maple, walnut, acacia, and velvet oak.

Cedar is undisputably the most valuable specie, yielding excellent material for building purposes, either sawn or in logs. Fir is suitable for building purposes, however, it had but little application since cedar is invariably used instead. Larch-tree is indispensable for railway sleepers, props and piles, owing to its special resistance to moisture. Leafy species are suitable for the manufacture of veneer and 3-ply wood, the demand for which increases every year. They also offer excellent material for cabinet making, while aspen supplies material for match factories.

Strange as it may seem, the whole production of saw-mills situated along the line of the Ussuri Railway before 1917 did not exceed 5 million cub. feet a year. The main consumers were the Ussuri Railway, the Vladivostok Fortress, and also the town and adjacent summer resorts. The best equipped saw-mills in that part of the country where Sinkevicz Bros.' saw-mill at the station Hor, then L. S. Skidelsky successors' saw-mills at the stations Bikin and Iman, Streletzky's and Kuzin's mills at the station Iman, and Borodin's saw-mill at the station Ussuri. Apart from these there was L. S. Skidelsky successors' 3-ply wood factory, which was the only one of its kind in the maritime province. All these mills used to cut an average of 75,000 to 100,000 cedar logs a year 21 feet in length and with an average diameter of 17-in. at the upper end. This made up about 3 to 4 million cub. feet of sawn timber, while about 1 million cub. feet were used in the manufacture of 3-ply wood.

The trees were usually cut by gangs of Chinese or Russian lumbermen, who sometimes used to make up trains of 100 and more horses. At the beginning of winter they would go to the forest, cut trees and transport them down to the rivers. Before the revolution of 1917 there were no long-term leases granted on concessions. The forest administration would cut the area available into separate lots and lease them by auction for a period of two years. This was quite sufficient time, since labor was then plentiful.

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[*] A cubic sazhen is 343 cubic feet.

During the period from 1914 to 1917 a cedar log 21 feet long and 17 inches in diameter at the upper end would cost at the mill 5.50 to 6.00 gold roubles, including stump tax, sawing, transportation, etc. Such a log usually yielded 25 cub. feet of sawn timber, making 22 to 24 gold kopecks per cubic foot of sawn timber. Freight from saw-mills to Vladivostok at that time did not exceed 5 to 6 kopecks per cub. foot, thus a cub. foot of timber cost not more than 30 to 33 gold kopecks delivered in Vladivostok, while the market price was 40 to 45 kopecks. This gave a net profit of 10 kopecks per cub. foot. Nobody thought of exporting timber since the Vladivosok Fortress and the Ussuri Railway, as well as the population usually bought up the entire production and only in a few instances were small parcels of timber shipped to Japan and other countries.

The revolution of 1917-21, the civil war, the Japanese military occupation of the whole Ussuri line in 1920-21, the destruction of bridges by partizans and the pilfering of the saw-mills caused great losses to concessionaires, who were compelled to discontinue work and even leave cut logs in rivers. In 1922 all saw-mills were stopped. In addition the exhorbitant railway tariff introduced in 1921 (30 kopecks per cub. foot from Iman to Vladivostok) made the cost of transportation prohibitive.

Such, in general, is the forest position along the zone of the Ussuri Railway. In spite of the enormous reserves only a small part has been exploited. At the same time a fully developed timber industry in the zone of the Ussuri Railway has a great future in store. It is but natural that the timber industry in the Ussuri country will not remain in the same state of stagnation as it is at present. It must and will develop, however, this development follow a carefully worked out plan and the rapacious methods of working hitherto employed definitely abandoned. As is evidenced from the foregoing, the cost of one cubic foot of sawn timber delivered at Vladivostok was about 35 gold kopecks. But this price could have been much lower if the mills were better equipped, the methods of production more scientific and the transport from the forest to the saw-mills and from there to the town more satisfactory.

In order to develope the timber industry in the Ussuri country, it would be necessary to construct about 150 to 200 versts of side lines at the stations Ussuri, Iman, Bikin, and Hor. Then the rivers should be cleaned in order to enable the floating of timber in spring. It would be further necessary to erect well equipped saw-mills and 3-ply wood factories in places best suited for the purpose. Great advantages are offered by the village Rakitnee situated on the river Vak. It would be necessary to construct a line about 50 versts long connecting that village with the station Iman. The line would cross a plain and no tunnels and bridges would be required. Another place is the confluence of the rivers Daubikhe and Ulakhe which could be reached by extending the Sviagin line some 30 versts. It would also be advisable to construct two lines of an aggregate length of 100 versts from Bikin and Hor reaching right into the heart of the forests.

Simultaneously with saw-mills there should also be constructed various plants for the extraction by products from timber, paper mills, wood-pulp mills, and others. Well equipped mills with railways, rafting rivers, and low tariff will appreciably lower the price of timber and it would find a ready sale on foreign markets. It is only necessary to adapt the production to the requirements of those markets. The enormous reserves of high-grade timber, the close proximity of consuming markets, requiring timber in large quantities creates especially favorable conditions for a development of that industry and facilitates competition with Oregon pine, which is more expensive than cedar.

Apart from markets adjoining the maritime province, Ussuri timber could enjoy a great and steady demand in more distant countries of the Pacific, as in the instance of Australia, which requires about 10 million cubic feet of timber for cases, this figure showing a tendency to grow. Here also Ussuri timber has the possibility of competing with Oregon pine.

Naturally the organization of the timber industry in the Ussuri country will only be made possible with the assistance of foreign capital since the Russians have none. There is but little doubt that foreign firms interested in that industry will be able to take advantage of the situation and begin the exploitation of the enormous reserves of timber, provided, naturally, that conditions are created guaranteeing a possibility of private enterprise and of a sound organization of the enterprise.

CHINESE GOVERNMENT RAILWAYS

Approximate Financial Returns for the Year 1922

The following figures are only the approximate returns of the various lines, and are subject to revision when the complete annual for the year is published:—

Name of Line		Operating Revenues	Operating Expenses	Net Operating Revenues	Income Debits	Income Credits	Net Debits	Surplus for the Year
Peking-Hankow ..	..	$25,500,000	$12,500,000	$13,000,000	$4,000,000	$650,000	$3,350,000	$9,650,000
Peking-Mukden ..	..	20,451,791	13,873,151	6,578,640	1,141,372	423,494	717,878	5,860,762
Tientsin-Pukow ..	..	16,000,000	9,750,000	6,250,000	4,920,000	322,000	4,598,000	1,652,000
Peking-Suiyuan ..	..	7,581,644	4,219,406	3,362,238	3,127,636	117,737	3,009,899	352,339
Shanghai-Nanking ..	..	7,572,529	4,525,891	3,046,638	1,604,113	41,143	1,562,970	1,483,668
S'hai-Hangchow-Ningpo	..	3,663,009	3,183,613	479,396	1,258,714	165,357	1,093,357	*Def* 613,961
Cheng Tai	..	3,590,118	1,597,419	1,992,699	290,262	62,520	228,742	1,764,951
Canton-Kowloon ..	..	1,540,000	1,030,000	510,000	760,000	190,000	590,000	*Def* 60,000
Kirin-Changchun ..	..	2,783,250	1,810,220	973,030	416,460	28,910	387,550	585,480
Taokow-Chinghua	..	1,375,000	622,000	753,000	507,000	2,000	505,000	248,000
Lung-Hai	..	3,150,000	1,400,000	1,750,000	—	—	—	1,750,000
Kaifeng-Honan ..	..	2,436,000	1,036,000	1,400,000	382,000	62,520	227,742	1,764,957
Hupeh-Hunan ..	..	1,890,788	1,629,859	260,929	2,319,059	174,735	2,144,324	*Def* 1,883,395
Chuchow-Pinghsiang	..	519,851	632,000	*Def* 112,149	1,500	2,500	*Credit* 1,000	*Def* 111,149
Changchow-Amoy	..	76,826	85,738	*Def* 8,912	127,025	1,189	125,836	*Def* 134,748
				Not arrived.				
Ssu-Tao, Chinese	1922	98,130,806	57,895,297	40,235,509	20,855,141	2,245,785	18,609,356	21,626,153
Government Railways	1921	95,218,000	52,503,000	42,715,000	21,539,000	2,536,000	19,003,000	23,712,000
Increase		2,912,806	5,392,297					
Decrease		—	—	2,479,491	683,859	290,215	393,644	2,085,847

(1) There is no report for the yearly Income Account, as the Lunghai Railway is still under construction.
(2) The approximate return of 1922 for the Ssu-Tao Railway is not reported.
(3) The approximate return of Lunghai for 1921 is not included.

Government Bureau of Economic Information.

Canton Reclamation Project

ONE of the projects now under serious consideration by the municipality, says the *Canton Times*, is the reclamation of that whole stretch of territory starting from the front of the Hospital Doumer and extending westward as far as the Canton Hospital, thus connecting the Dutch Folly which will form part of the new bund. Mayor Sun Fo has had this undertaking in his mind for the last two years and but for the lamentable *coup d'etat* of Chen Chiung-ming, he might have carried it to completion by this time. The area thus reclaimed is estimated to measure 1,843 *cheng* of land suitable for building lots.

The cost for the reclamation including the construction of a new bund, excavation works, and deepening of the river-bed, etc., is estimated at a total of $1,368,000. The old materials recovered from the demolition of the Haichu buildings and the old bund, etc., will easily fetch $77,000. This reduces the net cost of the reclamation to $1,291,000 or about $700 per *cheng* of reclaimed land.

Taking the present values of land in this locality that is land between Hospital Doumer and Canton Hospital, which range from $2,000 to $4,000 or an average of $3,000 per *cheng*, it can be readily seen that a profit of $2,300 per *cheng* can be realized without any trouble, thereby bringing the total profit to $4,238,900.

From a financial standpoint, the project is certainly a paying proposition. The problem before the municipality, however, is how to finance the project. Conceivably a loan for the amount can be made. Perhaps there may be some difficulties to be encountered at this time but if the loan proposition is not feasible, the lots may be sold in advance. There is no question that the latter scheme is quite feasible in the event of failure to raise a loan. The only objection is the possibility of reduced profits for the municipality by almost one-half. This is a consummation hardly to be wished for it means depriving the city of that much money for improvements.

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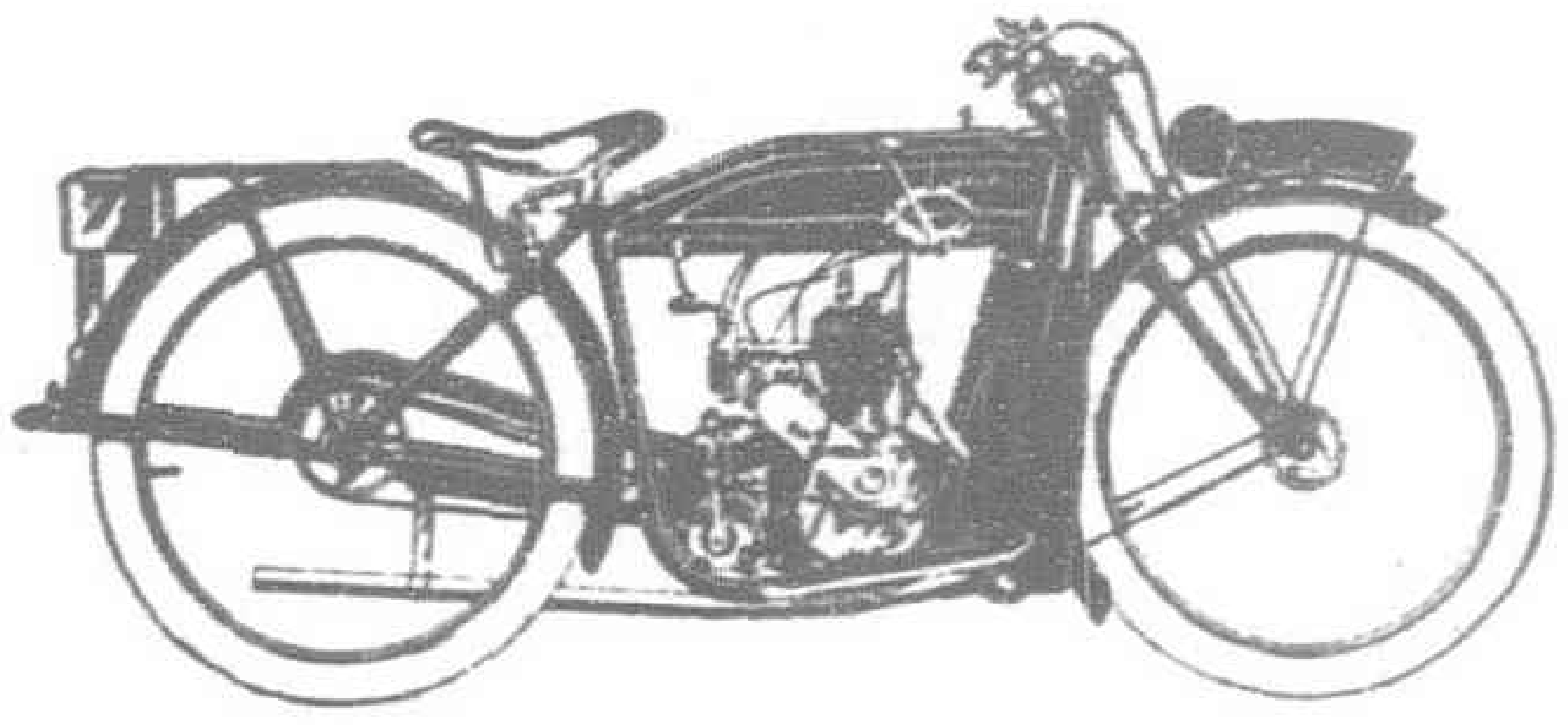

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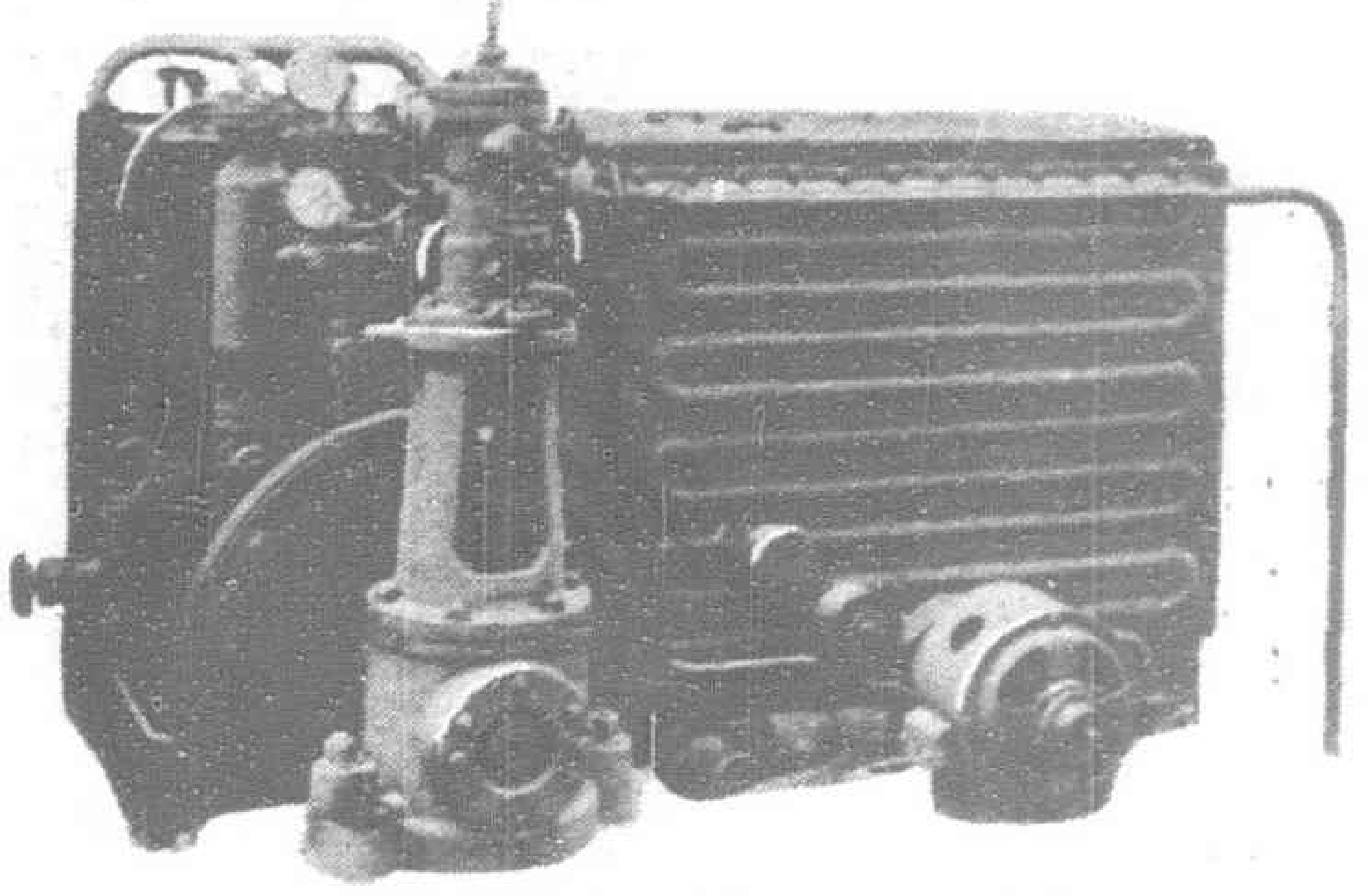

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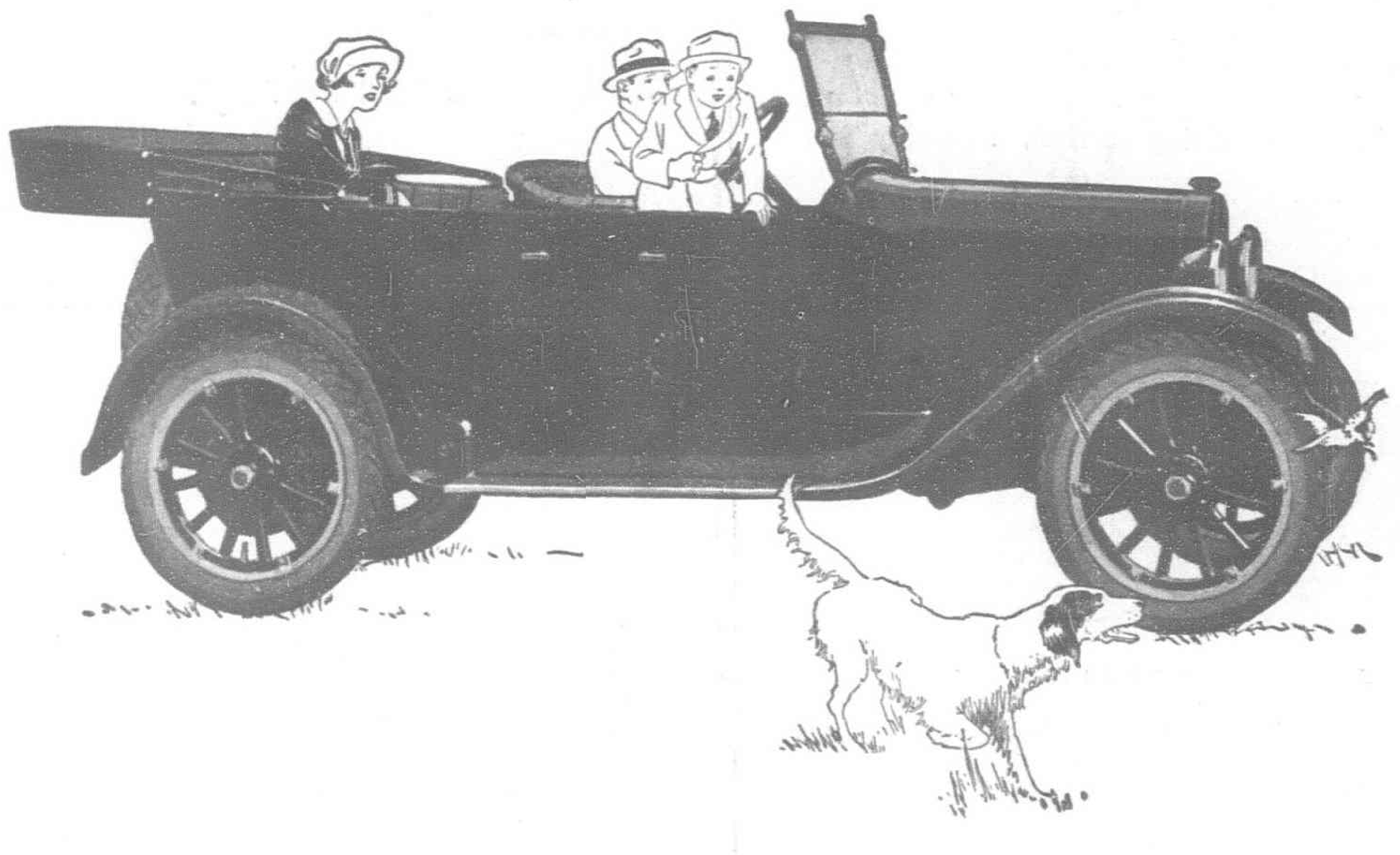

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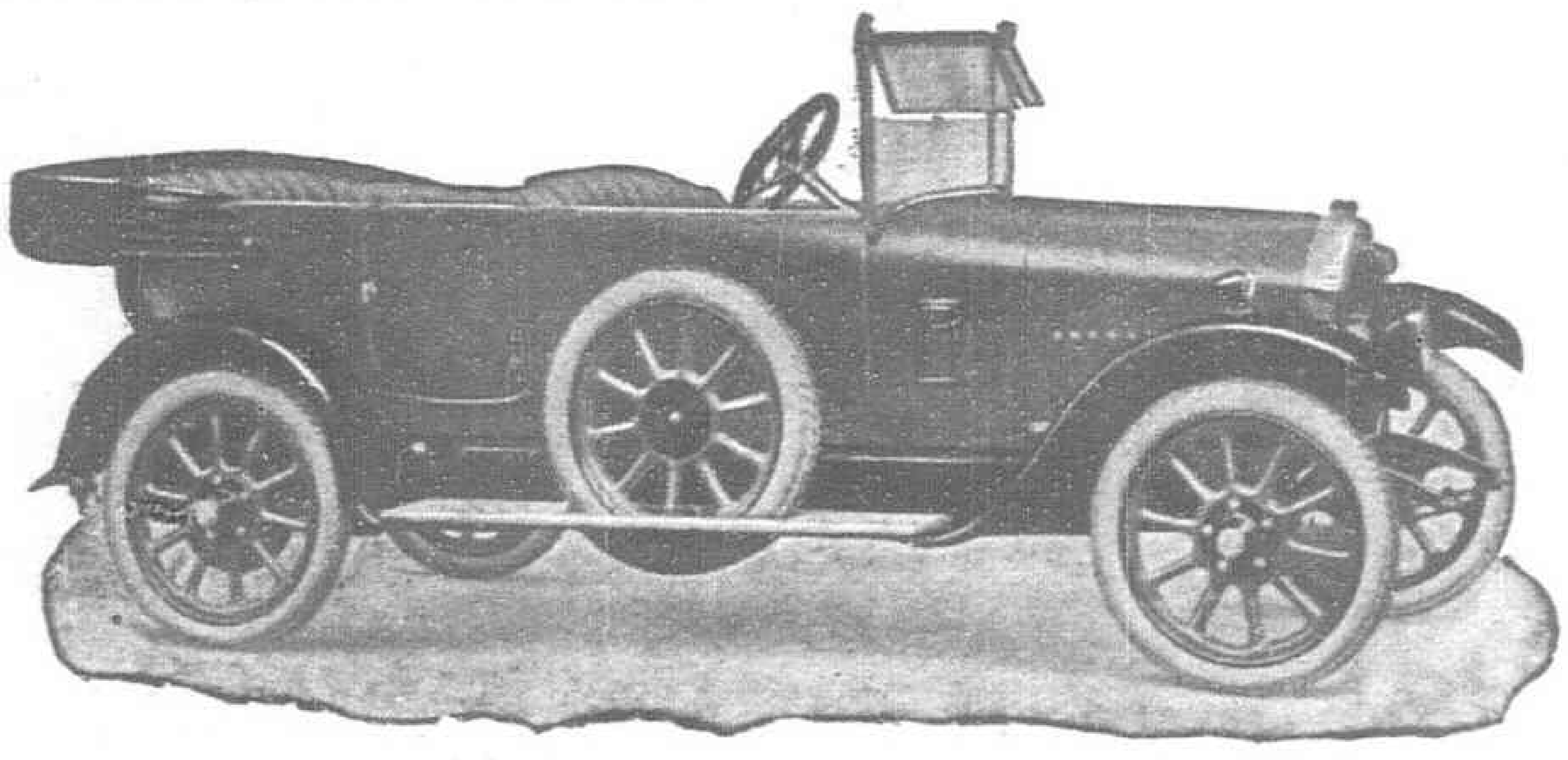

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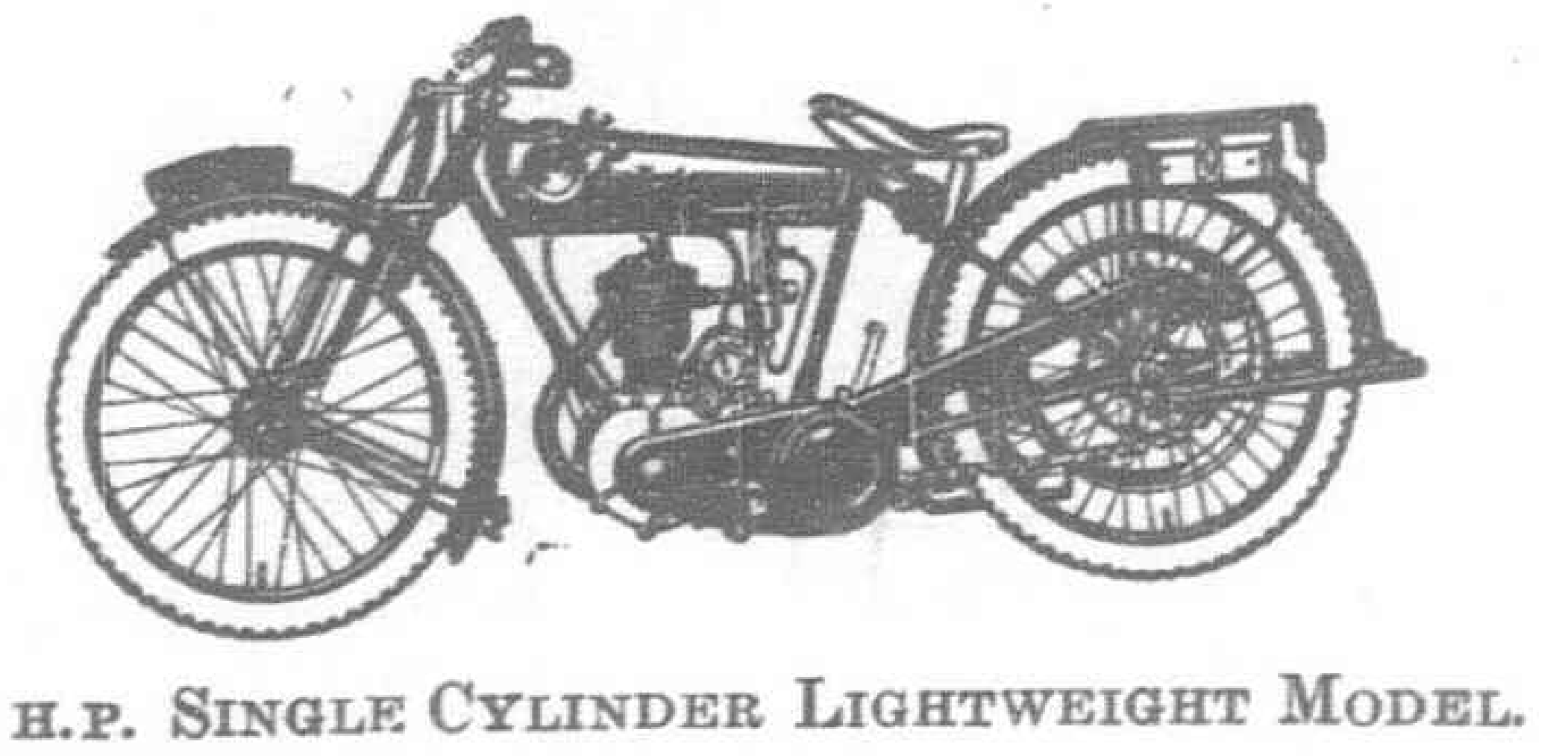

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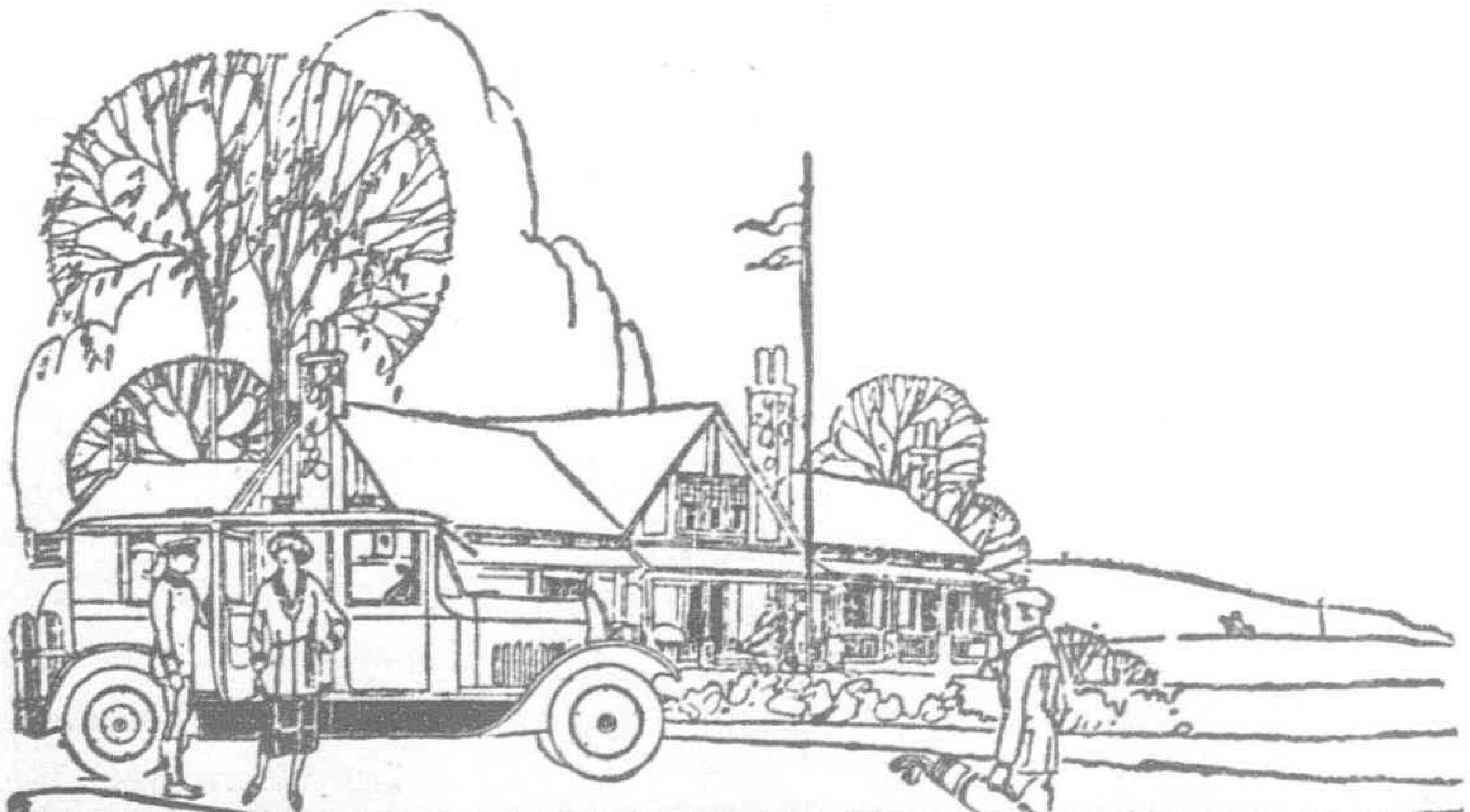

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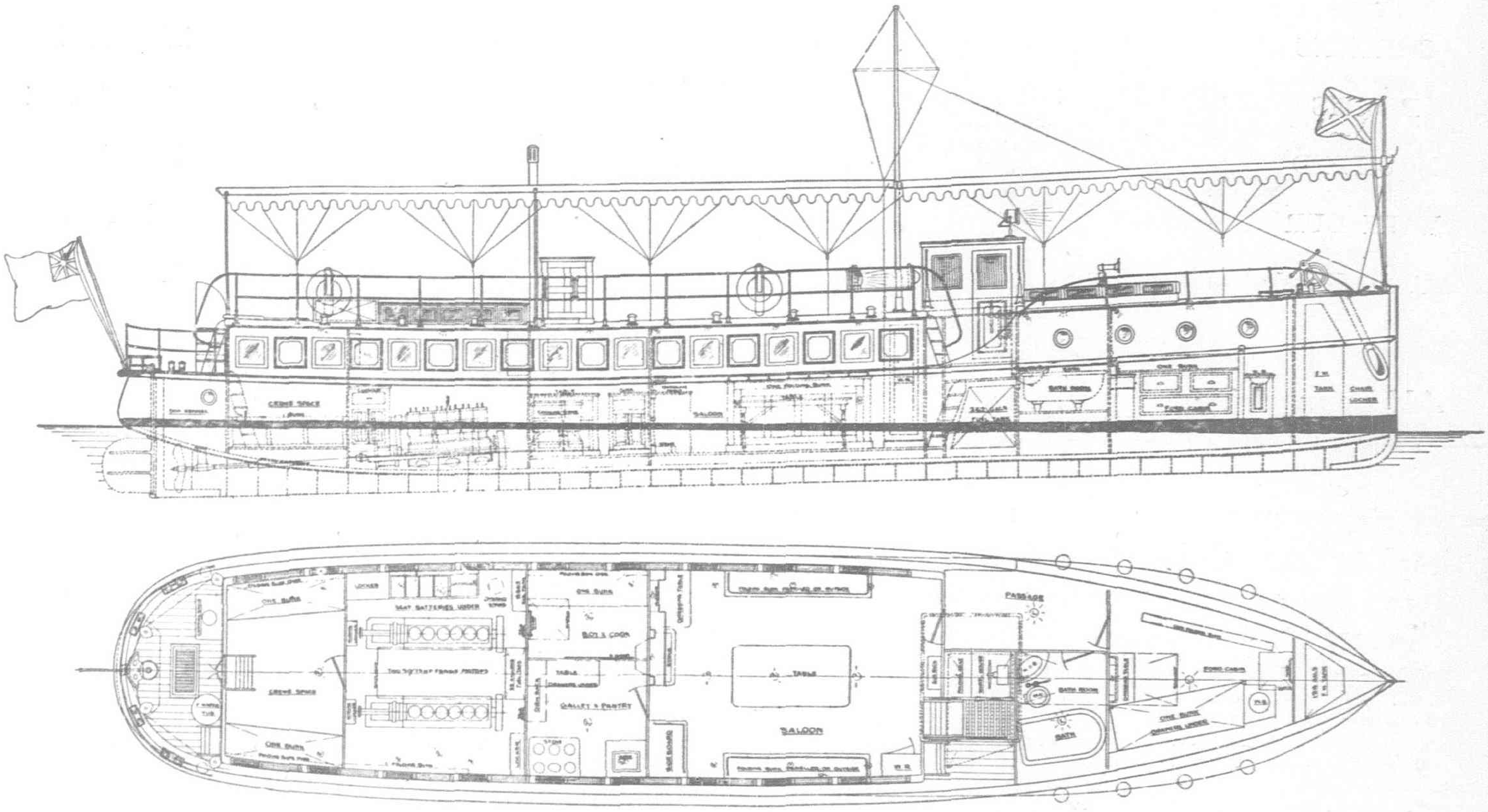

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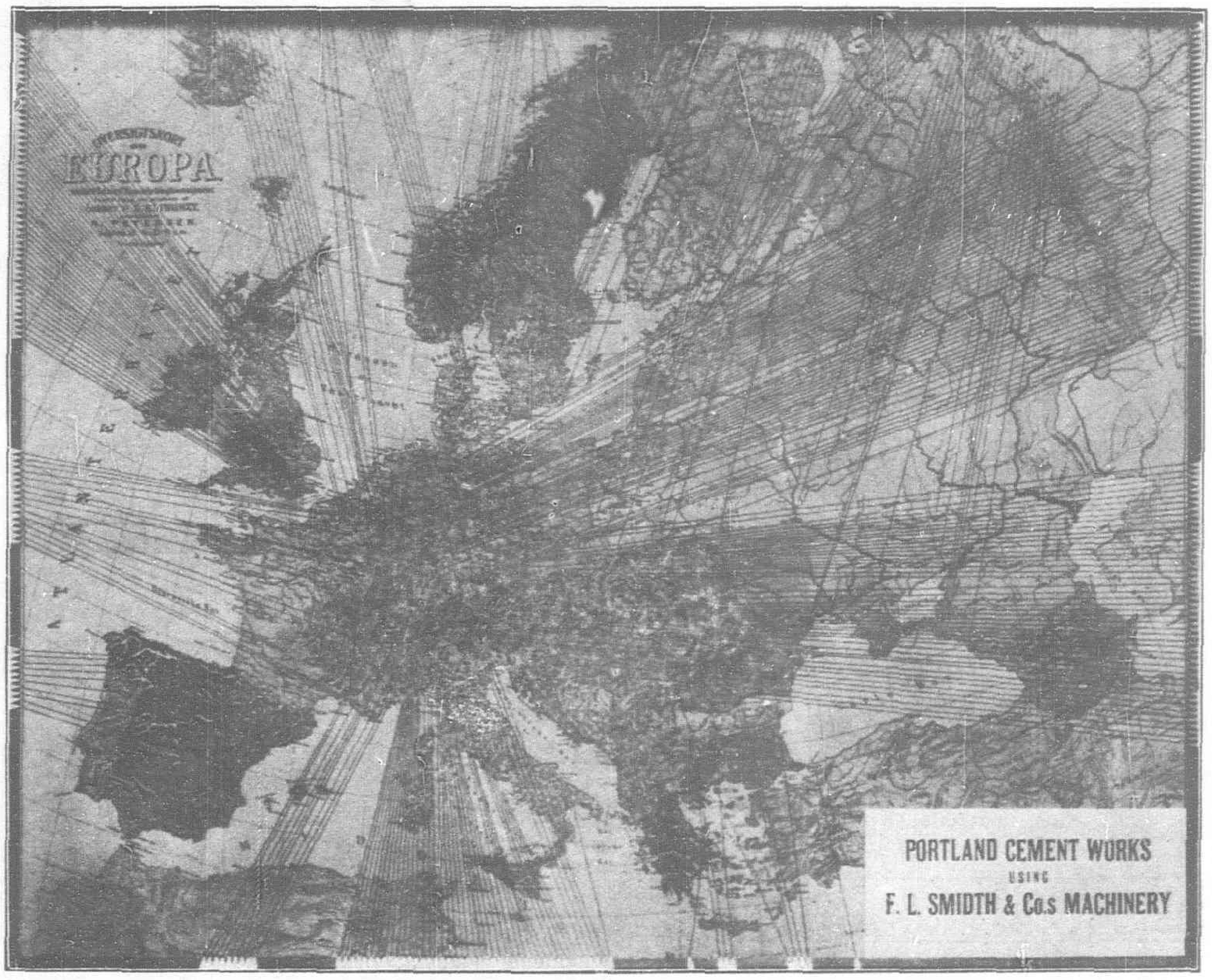

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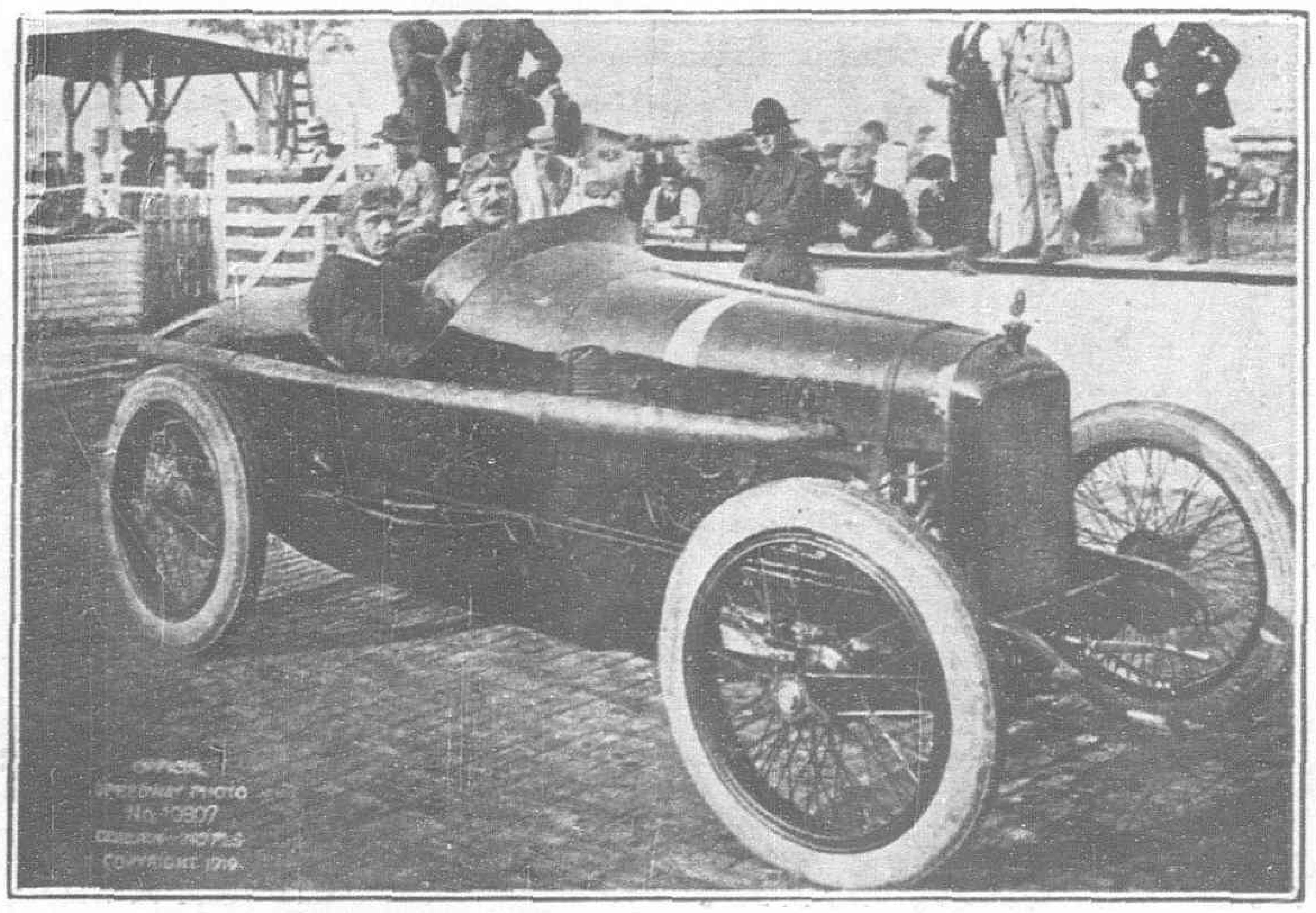

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SHANGHAI, CHINA

Graphite Cup Greases

Cup Greases containing fine flake graphite reduce friction to a minimum. By using these high-grade graphited greases bearings soon acquire the well-known graphite polish that eliminates friction and causes easy running. Used in all grease cups, wheel spindles, etc.

Dixon's Graphite Cup Grease No. 3 is recommended, except in warm climates, where No. 5 is more suitable. The consistency of each grade changes but little under wide temperature variation.

The importance of attending to the numerous small bearings and moving parts of cars is frequently overlooked. Wherever you see a grease cup don't think it is put on as an ornament, but give it a turn once a day or once a week according to the requirements. Don't forget to keep the cups filled with grease.

Sold in one, five and ten pound tins. Larger packages if desired.